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ABSTRACT

Pictures are often used by cognitive psychologists to investigate the development of cognitive functions. Different attributes of the picture, such as object or picture familiarity, word frequency, and age of acquisition, are known to correlate with naming latency and to affect memory, particularly retrieval processes. But without the use of age-appropriate stimuli it is difficult to determine whether age-related differences are due to immature memory systems or to the absence of particular items in the lexical or semantic networks of children. The purpose of this study was to obtain a normative database for pictorial material that will be useful for future studies with both young children and adults. Thirty adults and 30 children, ages 5 and 6, were asked in several sessions to name 400 individually-presented pictures, consisting of line drawings of common objects. Subjects were also asked about the familiarity and visual complexity of the picture. Among the findings were that young children are different from adults in both the name most frequently assigned and in the number of alternative names provided. The alternative names given by the children were either coordinate names or names of objects that are visually similar to the picture. In addition, the failure (to name) rate was higher among young children than adults. (Two appendices contain statistical data and pictures used in the study. Contains 27 references.) (EV)

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Picture Naming by Young Children: Norms for Name Agreement, Familiarity and Visual Complexity.

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ABSTRACT

Researchers concerned with the development of cognitive functions are in need of standardized material that can be used with both adults and children. The present article provides normative measures for 400 line drawings viewed by five and six year old children. The three variables obtained -- name agreement, familiarity and visual complexity -- are important because of their potential effect on memory and other cognitive processes. The normative data collected in the present study indicate that young children are different from adults in both the name most frequently assigned and in the number of alternative names provided. The alternative names given by the children are either coordinate names or names of objects that are visually similar to the pictured object. In addition, the failure (to name) rate is higher among young children compared to adults. Thus, we conclude that unequivocal interpretation of age-related differences in cognitive functions can be made only when age-appropriate pictorial stimuli are chosen.

Picture Naming by Young Children: Norms for Name Agreement, Familiarity and Visual Complexity.

Pictures are often used by cognitive psychologists investigating the development of cognitive functions. Different attributes of the picture, such as object or picture familiarity (Lachman & Lachman 1980), word frequency (Oldfield & Wingfield 1965), and age of acquisition (Carroll & White 1973), are known to correlate with naming latency and to affect memory, particularly retrieval processes.

Normative data for pictures have been collected by Snodgrass and Vanderwart (1980) for young adults, and by Berman, Friedman, Hamberger and Snodgrass (1989) for 8-10 year old children, but similar systematic information is still unavailable for younger children. There is evidence that name agreement (Berman et al., 1989; Johnson & Clark, 1988), picture familiarity (Berman et al., 1989) and age of acquisition (Walley & Metsala, 1992) differ between young children and adults. Researchers working with this population are aware of the need to use age-appropriate materials, and therefore choose pictorial stimuli from coloring books and other materials designed for young children. A drawback of this approach is that considerable variation exists between different renderings of the same concepts, such as in amount of detail, object positions, size, etcetera. Thus, it is difficult to compare data sets acquired in different laboratories. Moreover, developmental studies require comparison between groups that vary in age and that will most likely differ in their cognitive performance. For example, Graf (1990) obtained a smaller priming effect in an implicit memory task with children compared to adults when the stimulus materials were normed for adults. However, when the stimulus materials were normed for children, no difference in the priming effect was found between children and adults.

Thus, without the use of age-appropriate stimuli it is difficult to determine whether age-related differences are due to immature memory systems or to the absence of particular items in the lexical and/or semantic networks of the children.

The motivation for the present study was to obtain a normative database for pictorial material that will be useful for future studies with both young children and adults. We recruited 5 and 6 year old children, tested them individually, and asked them in several sessions to name 400 pictures presented one at a time. These 400 pictures included the 260 line drawings that were normed for young adults by Snodgrass and Vanderwart (1980) and for 8-10 year old children by Berman et al. (1989) (Set 1), the 61 pictures normed by Berman et al. (1989) for both young adults and 8-10 year old children (Set 2), and 79 new pictures (Set 3). In addition to naming, the children were asked to rate the complexity of the pictures and their familiarity with the concept depicted by each picture.

Picture naming in children appears to be affected by variables similar to those that affect picture naming by adults. Therefore, we will first briefly review the literature that deals with the effect of different pictorial characteristics on adult performance, and then we will provide some background on pictorial processing in children.

Studies of picture-naming in adults are based upon measurement of the time it takes for a subject to produce the first name that comes to mind (Carroll & White 1973; Humphreys, Riddoch & Quinlan 1988; Oldfield & Wingfield 1965; Paivio, Clark, Digon & Bons 1989, Snodgrass & McCullough 1986; Snodgrass & Yuditsky, in press). The underlying rationale is that the picture's attributes affect the length of time it takes to access the picture's name. Correlations between naming latency and word frequency, concept familiarity, age of acquisition, visual complexity, and word length have been used to assess which of these variables is the

determining factor in the processes that underlie picture naming. Those attributes that prolong naming latency in adults have also been shown to affect the level of naming accuracy and/or latency in young children (Johnson & Clark 1988; Johnson, 1992).

Lachman and Lachman (1980) suggest that the crucial variable affecting naming latency is the codability or the uncertainty of the name. Uncertainty is theoretically defined as the number of names that are connected to an object's representation. In practice, it is possible to measure uncertainty by determining the number of names given by a group of native English speakers. The number of alternative names elicited by a picture is reflected in the H statistic that has been used as a measure of name agreement in previous picture-naming studies (Berman et al. 1989, Snodgrass & Vanderwart 1980), and is also computed in the current study.

Oldfield and Wingfield (1965) argued that the time it takes to name an object is a linear function of the log frequency of the occurrence of the object name in written language. Humphreys et al. (1988) claimed that word frequency affects naming latency only for pictures chosen from categories in which items are visually different from each other. Carroll and White (1973), however, argued that pictures whose names were learned early in life are named more rapidly than pictures with names that were learned at a later age and, therefore, age of acquisition and not word frequency determines naming latency. In a recent study, Morrisson, Ellis and Quinlan (1992) reported additional evidence in support of the importance of age of acquisition over word frequency, and added that latency is affected more by the length of the picture's name than by word frequency. Snodgrass and Yuditsky (in press) asked college students to estimate the age at which they learned 250 of the 260 Snodgrass and Vanderwart (1980) concepts. Although most of the concepts were learned at an early age, subjects placed age of acquisition for some concepts as late as 13 years. This suggests that some of the concepts used in the

present study may not have been acquired by the 5-7 year old children. This would be reflected in low name agreement, and/or in errors in which pictures are named with the names of objects that look similar to tested concepts.

Healthy adults are highly accurate in picture naming tasks, but patients who have suffered from various types of neurological damage produce many incorrect names. Analysis of the errors made by these patients in picture naming tasks can provide more information about the naming process. Most of the current models assume at least three serially organized stages involved in picture naming: object identification, name activation and response generation (Lachman & Lachman 1980; Paivio et al. 1989; Snodgrass & McCullough 1986). In some models an additional semantic activation stage is assumed to occur before name activation (Humphreys et al. 1988; Morrison et al. 1992). For example, Humphreys et al. (1988) obtained naming error data from a patient who had a deficit in identifying visually presented objects, but was able to name with normal accuracy the same objects when he touched them, or when their definitions were presented auditorily. The patient was more likely to correctly name high frequency concepts from structurally distinct categories, suggesting that access to semantic or name information depends upon the degree of similarity between the depicted object and other concepts within the same category.

The processes subserving picture naming are assumed to involve the activation of multiple candidates that share either perceptual or functional characteristics. Under speeded naming conditions more errors are made, because there is not enough time to distinguish between the different candidates. Vitkovitch, Humphreys and Lloyd-Jones (1993) claimed that the types of errors produced under deadline conditions depended upon the category to which the picture belonged. They defined two kinds of categories, one in which the members are perceptually

similar, like fruits or quadruped animals, and one in which members are perceptually distinct from one another, such as toys or furniture. Categories of the first type are defined as "structurally similar" whereas those of the second type are termed "structurally dissimilar." Vitkovitch et al. (1993) hypothesized that, for items drawn from structurally similar categories, errors would be names of concepts that are perceptually and functionally similar to the picture. Such naming errors were denoted 'visual+semantic' as opposed to 'pure semantic' and 'pure visual' errors. Naming errors from structurally dissimilar categories were expected to come from all three error types, and thus to be more diverse than those of structurally similar categories. Their findings confirmed this hypothesis, although in both structurally similar and structurally dissimilar categories 'visual+semantic' errors predominated.

Young children are less efficient in picture naming tasks than are older children and adults (Wiegel-Crump & Dennis, 1986). Even under no time constraint they fail to name pictures as accurately as adults. With maturation, children respond faster and reach adult levels of accuracy. Even under the assumption that picture naming in young children involves the same three- or four-stage model as in adults, it remains unknown whether maturation affects these stages similarly or whether specific stages are affected differentially. Johnson (1992) found that name uncertainty (pictures with multiple possible names) affects children's accuracy and latency, and she showed its effect on postidentification stages (name activation, response generation or both). Thus, an uncertainty measure (such as the H statistic used here) is essential when researchers select pictorial stimuli for studies with children. In addition, it is not clear whether or how young children's errors depend upon categorical distinctions because young children's categorical knowledge is still developing. For example, Nelson (1974) claimed that subclass categories (insects vs. animals, or fruits and vegetables vs. food) are less clearly defined by children.

Sperber, Davies, Merill and McCauley (1982) argued that visually similar categories develop earlier than conceptual categories. Therefore, young children might not exhibit the effect found by Vitkovitch et al. (1993) of more visual+semantic errors for structurally similar categories, because this distinction may not yet be within the young child's cognitive repertoire.

There are many questions one might ask about the processes involved in picture naming by young children. However, the main goal of this paper is to provide normative data for pictorial stimuli for use with young children. The normative data include the most common name given to each of the 400 concepts (modal name), name agreement, picture familiarity, visual complexity, word frequency, and word length. Because the name agreement of many concepts is low for young children, we present the alternative names and describe the pattern of naming errors produced by our sample of young children.

METHOD

Subjects

Children

Thirty children in kindergarten (21), first (7), and second grades (2) participated in the study. Their mean age was 6.07 years (range: 5.1 - 7.6, SD = 0.73) and 14 were girls. One additional child did not complete the task and was excluded from the analyses. Most of the children (26) were recruited through Manhattan Day School in New York City, and all were native English speakers. All read at or above grade level as assessed by the Wide Range Achievement Test (WRAT, mean standard score = 103.5; SD = 15.88). A socio-economic status (SES) index (Watt, 1976), with a range of 20 (graduate professional) to 134 (unskilled person), was obtained for each child (mean= 30.36, SD=1.83) based upon the education level and occupation of the children's parents. Informed assent and consent forms were obtained from

the children and their parents. After task completion subjects received a small gift.

Adults

Thirty volunteers took part in the study, half of whom were paid for their participation. One additional subject did not follow the instructions and was excluded from the analyses. Their mean age was 26.23 years (range: 19 - 35; SD = 3.97) and 11 were females. All subjects were native English speakers. The SES level for the adults was 48.24 (SD=3.41). Because the adult participants were mostly students, their SES scores were higher, indicating lower SES, than those of the young children.

Stimulus Materials

Children

The pictures were unambiguous line drawings of common objects. There was a total of 400 pictures that are presented in Appendix A. Set 1 included 260 pictures (numbered 1-260 in Appendix A) from the adult norms of Snodgrass and Vanderwart (1980), Set 2 was comprised of 61 pictures (numbered 261-321 in Appendix A) from the child and adult norms of Berman et al. (1989), and Set 3 included 79 pictures taken from a number of different sources (numbered 322-400 in Appendix A). These were stylistically similar to those in the Snodgrass and Vanderwart (1980) and Berman et al. (1989) normative data sets. The intended names of the 400 pictures (along with the norms measures) are presented in Appendix B. The pictures as well as their corresponding normative data can be downloaded from the following Internet address: **http://nyspi/research/rsp_indx.htm**. The 400 pictures were randomized separately for each subject and then divided into five lists, each containing 80 items.

Adults

The picture set for the adults included the 79 pictures from Set 3 plus the picture of the zebra taken from the Snodgrass and Vanderwart database. The zebra was added to create an even number of pictures and was not included in the analyses. The pictures were randomized separately for each subject and then divided into five lists each containing 16 items.

Procedures

Children

Each child was tested individually, in five sessions, at the school s/he attended. The child was tested on five different days for a period of time that varied between subjects and usually ranged from 20 to 40 minutes. In the first session, the child's reading level was estimated using the reading subtest of the WRAT. Next, the picture naming task was administered for the first list of pictures. In the following four sessions only picture-naming was performed with the remaining four lists of pictures.

In the naming task, the child viewed one picture at a time on a Macintosh (classic II) computer screen. The picture remained on the screen until the child provided the experimenter with information about the name, familiarity and visual complexity of the picture. On average, a picture was viewed for about 15 seconds. The instructions the children received were identical to those described in Berman et al. (1989) and their ratings were scored on a 3-point scale (1, 3, and 5 -- see below) rather than a 5-point scale as had been used in the Snodgrass and Vanderwart (1980) study with adults. This was done because Berman et al. had determined (in pilot testing) that even older children (8-10) did not assign ratings across the full range of numerical values in the 5-point rating scale supplied by the experimenter. For name agreement the child was asked "what is this picture." To obtain a score for familiarity the child was asked

"how often do you think about this thing? A lot, (scored 5) sometimes, (scored 3) or very little? (scored 1)." After giving the answer, the subject was asked "how difficult is it to draw or to trace this picture, is it hard, (scored 5) medium, (scored 3) or easy? (scored 1)." The answer to this question was used as a rating of the visual complexity of the picture. For cases in which the child did not recognize the object depicted, the next picture was presented. When a child could not name the picture, questions were asked that would aid in determining whether the child did or did not know the concept. This is important because young children comprehend many concepts that they fail to express verbally. The experimenter asked questions like "what can you do with it," or "where do you see it." If the answer indicated that the child did have knowledge about the object, then s/he was asked to answer the familiarity and the visual complexity questions. A short practice block was presented using pictures (not in the set of 400 experimental pictures) that were pasted onto index cards. To anchor the familiarity and complexity scales, a comparison between familiar and unfamiliar objects was demonstrated (ice-cream and canteen), as was a comparison between pictures that were visually simple and those that were visually complex (triangle and tape-recorder). All subjects' answers were entered by the experimenter into the computer database online.

Adults

Each subject was tested individually (half in our laboratory and half outside the laboratory in a quiet room in a community center in Manhattan) in one five-block session. Subjects were taught how to perform the task, i.e., how to enter their responses and how to use the computer. They were told to type the first name that comes to mind upon seeing the picture without concern for spelling. If they did not recognize the object or did not remember the name of the object they were told to select the appropriate option that appeared on the screen: "do not know

object" or "do not know name." In addition, subjects were asked to rate the familiarity and visual complexity of the pictures they recognized. Both familiarity and visual complexity were explained to the subjects in the same way as in Snodgrass and Vanderwart (1980). Subjects were told to rate familiarity by estimating how often they thought about the concept in their daily lives. The emphasis was on the concept itself rather than the way it was drawn. Subjects were given a five-point rating scale for familiarity, with 1 representing the least familiar and 5 the most familiar. Similarly, there was a five-point scale for visual complexity, with 1 representing the least complex and 5 the most complex. Complexity was defined as the amount of detail and number of lines in the drawing. Subjects advanced from picture to picture at their own pace, and the average session time was about 20 minutes.

Analyses

The following information was obtained for every picture.

Modal name - A modal name is defined as the name given by the majority of subjects. Errors were classified according to adult criteria, i.e., names that did not accurately describe the concept. An example of such an occurrence is the picture of the NAIL FILE; none of the children recognized the object as a tool with which to file nails, and their modal name is "knife." Two judges classified the modal names that were different for children and adults. The children's modal names were classified into one of the following categories: synonym, superordinate, subordinate, component (part of), coordinate and failure. Coordinates were defined as object names that were in the same category, whereas 'failures' were defined as names that were either visually similar to or had no relationship to the tested concepts. 'Failure' responses included names that were non-nouns (e.g., 'to fix stuff') or non-object (e.g., 'music'). Note also that classifying a name as a coordinate is dependent upon the definition of the category, which can be

more or less inclusive. For example, 'apple' and 'cucumber' can be exemplars of two different categories -- they can be categorized as fruits and vegetables, respectively, or as members of the same category, food. However, when both are classified as food they would be considered coordinates of each other, otherwise they would be classified as failures. Because the categories chosen are somewhat arbitrary, the coordinate responses can be viewed, to some extent, as failures. A third judge (YC) examined the judges' classifications and resolved discrepancies. There were 10 occurrences (out of a total of 89) in which the two judges did not agree with each other.

The same two judges reviewed individual subjects' non-modal names and classified each response into one of the above categories with respect to the adults' modal name. The judges did not agree with each other about 5% of the time, and a third judge (YC) resolved these discrepancies.

Name agreement - There are two measures of name agreement. The first is the percentage of subjects naming the picture with its modal name. The second is the information statistic, H, which was computed for each picture by the formula (taken from Snodgrass & Vanderwart, 1980)

$$H = \sum_{i=1}^{k} P_i \log_2 (1 / P_i),$$

Where k refers to the number of different names given to each picture, and P_i is the proportion of subjects who gave each name. The computation of H does not take into account 'do not know name' (DKN) or 'do not know object' (DKO) responses (for more information see Snodgrass and Vanderwart 1980). For the percentage measure, a higher number signifies greater name agreement. However, for the H measure, a lower number signifies greater name agreement; for

example, when all subjects supply the same name, the value is 0. A higher value indicates that a greater number of alternative names was supplied. The criteria used for counting different instances of names were the same as those used in the Snodgrass and Vanderwart (1980) study.

Familiarity - The familiarity ratings for the young children were assigned numerical scores of 1, 3 and 5 such that 1 corresponds to an unfamiliar concept (response of 'a little'), 3 corresponds to a somewhat familiar concept (response of 'sometimes'), and 5 corresponds to a highly familiar concept (response of 'a lot'). Adults used a 5-point rating scale with all of the values between 1 and 5. When a subject did not know the object depicted (DKO), a rating of familiarity was not available. Such occurrences were not included in computing the means (i.e., only the actual number of subjects who supplied ratings was used in computing mean values).

Visual Complexity - The visual complexity ratings for the young children were assigned numerical scores of 1, 3 and 5 such that 1 corresponds to a simple drawing (response of 'easy'), 3 corresponds to a less simple drawing (response of 'medium'), and 5 to a visually more complex drawing (response of 'hard'). Adults used a 5-point rating scale with all of the values between 1 and 5. When subjects did not know the object depicted (DKO), a rating of visual complexity was unavailable. As for familiarity, such occurrences were not included in computing the means.

Word frequency - We used the third grade frequency in print counts, which is the youngest age group in the American Heritage word frequency count (Carroll, Davis & Richman 1971). The frequency count is expressed as occurrences per million.

Length - The number of letters in the modal name.

Age of acquisition - The ages of acquisition of 250 of the 260 Snodgrass and Vanderwart (1980) concepts were taken from Snodgrass and Yuditsky (in press).

Naming Latency - Naming latency was measured as the time from picture onset until a key of the first letter of the name was pressed on the computer keyboard. The adult subjects pressed the letter on the keyboard themselves. Children told the experimenter the name of the picture presented, and the experimenter immediately pressed a key corresponding to the first letter of the name given. This is not the common way of measuring naming latency. However, because there is a high correlation between vocal naming latency and keystroke latency (Paivio et al., 1989), this indirect measure was used here.

The three sets of drawings, 260 items from Snodgrass and Vanderwart (1980), 61 items from Berman et al. (1989) and the additional 79 items, were analyzed separately, and two-tailed t-tests for paired samples were used (using the picture as the unit of measurement) to compare the data of the young children with the data of adults and older children. Missing values were excluded pairwise. In addition, two-tailed t-tests were used for comparisons among the three picture sets. Because many comparisons were performed, a significant difference was defined conservatively at an alpha level of 0.01.

RESULTS AND DISCUSSION

Snodgrass and Vanderwart pictures (Set 1)

Table 1 in Appendix B presents the data for the 260 pictorial stimuli, listed in alphabetical order according to their presentation in Appendix A (items 1-260). The six year old children provided modal names that differed from the adults' modal names for 35 of the stimuli (13.5%, denoted in Appendix B in bold type). These results contrast with those for 8-10 year olds reported by Berman et al. (1989), in which modal names differed between older children and adults in only 14 cases (5%). The 35 concepts with different modal names were divided into classes according to the relationship between young children's and adults' modal names. Five

concepts were classified as synonyms, for example teapot and kettle. Nine concepts were given a superordinate modal name, for example, bug for beetle, or bird for eagle. Component names relate as part to whole, such as salt and salt-shaker. Four modal names given were component names of the concept. Coordinate names occurred 14 times and included naming substitutions such as apple for cherry, and trumpet for french horn. Three concepts were classified as failures. These are 'ashtray', 'nail-file' and 'thimble.' In the case of the nail-file, most children thought that the picture was of a knife, a visually similar object. The picture of the thimble was recognized by six subjects, but the majority of the children called it 'a cup,' due to its visual similarity. However, the picture of the ashtray was not recognized at all by 24 (out of 30) subjects (DKO responses). The other six subjects gave different names, all of which were considered failures. This is a very interesting finding, because in the Snodgrass and Vanderwart study (1980), all the adults named the ashtray correctly and in the Berman et al. study (1989), 35 percent of the children named the object correctly. This seems to be not only a function of age, but may also reflect a change in culture. Due to laws that forbid smoking in public areas, young children have less exposure to cigarette ashtrays, which may explain its apparent absence from their semantic knowledge base.

Although Snodgrass and Vanderwart (1980) reported only a 1.7 percent failure rate in providing names, the present study elicited DKN and DKO responses at a rate of 9.8 percent. Many of the concepts for which the children's modal name matched that of the adults were also assigned a large number of alternative names. We deal with the issue of alternative names in greater detail in the section on naming errors.

Table 1 presents the summary statistics for the six measures obtained for the young children. It also includes the summary statistics for age of acquisition reported by Snodgrass and

Yuditsky (in press) and the summary statistics for naming latency. The corresponding measures for adults taken from Snodgrass and Vanderwart (1980), and for older children taken from Berman et al. (1989) are presented as well. It is apparent that whereas the summary measures of adults and older children are very similar to each other, the summary measures for young children differ widely.

Insert Table 1 about here

The measure of name agreement expressed by the information statistic H is highest for the young children, demonstrating that the youngest subjects produce more alternative names than the subjects in the other two groups. The highest value for the information statistic H in the young children is 3.25 compared to 2.55 and 2.58 for adults and older children, respectively. Interestingly, the 25th percentile (Q1) is relatively small for the young children. This is a result of the fact that the young group has more instances of DKO and DKN responses that did not enter into the computation of the H statistic. For example the concept 'wagon' has an H value of 0.0 in the young children, which means that all the subjects provided the same name. However, only 23 out of the 30 subjects named the picture, whereas the other seven subjects responded either DKO or DKN. Information about the number of subjects who provided the modal name is expressed by the percentage measure of name agreement. Two-tailed t-tests between young children and each of the other groups were found to be significantly different ($p<0.001$) for both the H and percentage measures of name agreement.

Two-tailed t-tests of the familiarity measure revealed that familiarity was lower in young children than in the adults or the older children ($p<0.001$). Young children show a smaller range

and less variation in their ratings of familiarity. These results are expected because young children have less experience with some of the concepts. Unlike the familiarity measure, the comparison of the visual complexity ratings revealed that the young children's rating is similar to that of the adults. However, comparison of young children with older children did result in a significant difference between the groups ($p<0.001$).

The number of letters in a word is a relevant variable in performance that involves short term memory. In particular, there is a linear relationship between the number of words recalled and the rate at which they can be articulated (Baddeley, Thomson & Buchanan 1975). This relationship was observed with children as young as 4 years old (Hulme, Thomson, Muir & Lawrence 1984). This suggests that young children produce shorter names when they do not use the adult modal name. This was supported by a comparison of the mean length of the modal names of the three groups. A two-tailed t-test revealed no significant difference between adults and older children, but a significant difference was obtained when comparing adults to young children ($p<0.001$). One simple reason for this is the fact that modal names provided by older children were different from those provided by adults on only 14 items, a difference which is not statistically significant. However, young children's modal names differed from the adult modal names for 35 items, and those items tended to have fewer letters. In general, it is more likely for children to choose short, simple words, because they are the ones learned earliest, and consequently are better represented in their lexicons.

Each of the variables measured plays an important role in various cognitive tasks. Often the question arises as to which of the variables directly affects performance on a given task. Before this question can be answered, however, it is necessary to know the relationships among the measures. Table 2 shows the correlation matrix for the young children with the significant

correlation coefficients marked with an asterisk (*). As expected, the two measures of name agreement show a high negative correlation. Familiarity, complexity, length, and word frequency show low intercorrelations, suggesting that they reflect orthogonal constructs. This pattern, with sightly larger values, was also found by Snodgrass and Vanderwart (1980) and Berman et al. (1989). The correlation between age of acquisition and name agreement indicates that for concepts acquired at an early age the level of agreement is high. The fact that young children's name agreement correlates less with word frequency than with age of acquisition is similar to the finding that for adults, age of acquisition has a greater influence on picture naming than do other variables (Carroll & White 1973, Morrison et al. 1992). Note that age of acquisition used in the present study was estimated by adults.

Insert Table 2 about here

Naming latency usually indicates the relative degree of difficulty in retrieving names from semantic memory. Although our naming latency was recorded in an indirect way, it appears to be a valuable measure that shows some degree of face validity because, as seen in Table 2, naming latency correlates significantly with each of the other variables. The correlations between naming latency and the measures of name agreement are particularly high, indicating that less time is required to access names that most subjects agreed on. That is, high name agreement is associated with a smaller number of alternative or competing names, which may explain why picture naming that involves searching this "smaller" name-space is faster. However, in addition to name agreement, familiarity of the depicted object affects the naming process and correlates in the expected direction with naming latency.

Error analyses

The children's naming errors are generally real words in the language (only 3 responses were not words). However, at times they are grammatically incorrect. For example, "rolling baker" for rolling pin, or "light changing" for traffic light. This type of response is similar to DKN, because it indicates that the subjects recognize the object but cannot name it. Misidentification, such as calling asparagus a "candle" or artichoke a "parachute," is another common error type. These kinds of responses can be viewed as DKO responses because they indicate that the subject did not recognize the object. Alternatively, it is possible that some pictures did not clearly depict the concepts they were meant to represent, and therefore they elicited names of visually similar objects. An example of this is the picture of the thimble, which was named by 10 children as a cup. Both types of errors were considered failures. All the nondominant names given by the young children are presented in Table 1 of Appendix C (items 1-260).

In order to characterize alternative (i.e., non-modal) names, the scheme provided by Snodgrass and Vanderwart (1980) was followed, in which these names were classified into synonyms, superordinates, subordinates, components, coordinates, and failures. Table 3 presents the results of this classification for 14 selected categories. The categories are those used by Snodgrass and Vanderwart with the addition of the category 'toys', which we thought was relevant. A list of the items within each category appears in Appendix D.

Insert Table 3 about here

In Table 3 the column labeled 'intended name' (INTEND) shows the percentage of children's responses that match the adult modal names. The category 'tool' shows the lowest percentage of adult modal names and no synonym responses. However, the 'toys' category shows a higher percentage of adult modal names and also shows the largest percentage of synonyms; concept and synonym responses together account for 90% of responses in this category. Table 3 clearly indicates that those categories that include items outside the children's daily experience, such as tools and musical instruments, have a low percentage of adult modal names and low synonym responses. In contrast, categories that include items commonly found in children's environments, such as toys and vehicles, show a higher percentage of adult modal names and synonym responses. The insect category shows the largest percentage of superordinate responses, because children frequently refer to any kind of insect as a "bug." However, overall, most of the non-modal names are of the coordinate class, which may indicate that children have knowledge of the category to which the concepts belong, or that the children misidentified the depicted object. Most of the coordinate responses consist of objects that are visually similar to the object depicted in the drawing.

To summarize the results of Set 1, it was found that young children are less accurate in naming the 260 pictures, which is reflected in lower name agreement compared to that of adults and older children. The familiarity ratings of the young children also differ from those of the adults and older children, and are consistent with the young children's lack of experience with some of the objects, such as tools and musical instruments. On the other hand, the measure of visual complexity was fairly similar between the age groups, and this suggests that familiarity does not play a role in judging visual complexity. Despite these differences, the pattern of relationship among the variables is comparable across all groups. The data do not appear to

reflect perceptual or functional differences among the groups, but rather the lack of knowledge of particular concepts by the young children. Therefore, pictures from this set that were rated similarly by young children and adults can be used in developmental studies of memory and other cognitive processes.

Berman et al. pictures (Set 2)

Table 1 in Appendix B presents the data for the 61 pictures listed in alphabetical order according to their presentation in Appendix A (items 261-321). Table 1 in appendix C presents all the nondominant names for these pictures (items 261-321). The six year old children provided modal names that differed from the adults' modal names for 27 concepts (44% of the concepts) as compared to 11 items (18% of the concepts) for which the modal names given by the older children differed from the adults' modal names in the Berman et al. study (1989). The 27 pictures with different modal names include four synonyms, six superordinates, and four component names (part of). In addition, there were eight stimuli with coordinate names, and four failures. The failures were; 'box' for the picture of basin, 'mirror' for the paddle, 'bed' for the pinball machine, and 'refrigerator' for the picture of a safe. One more picture, that of a fishing reel, was not recognized by most children (22) and the other seven children each gave a unique and unrelated name, and so 'fishing reel' does not have a modal name for this age group. Twenty seven percent of the responses to this set of pictures were either DKO or DKN, resulting in a low mean percentage of name agreement (47%).

Insert Table 4 about here

Table 4 presents summary statistics for the six measures of the young children's responses, and the summary statistics for naming latency. The corresponding measures for adults and older children taken from Berman et al. (1989) are presented as well. Two-tailed t-tests between young children and each of the other groups were found to be significant ($p<0.001$) for both measures of name agreement (H and %), indicating, as for Set 1, that the youngest subjects produced more alternative names than subjects in the two older groups. Of the alternative names given by the young children, 8.3 percent bear no relationship to the concept represented by the picture and thus were considered failures.

The young children rated the items less familiar than either the adults or the older children although this difference was not significant. Comparisons of visual complexity ratings among groups yield a significant difference only between young children and adults ($p<0.001$). The range and skew of the values suggest that young children tend to rate the pictures as more visually complex than do adults and older children. Comparing the mean lengths of the modal names between the three groups reveals no significant difference, although the young children do tend to use shorter names.

Table 5 shows the correlation matrix for the young children with the asterisks (*) indicating the significant intercorrelations. As expected, the two measures of name agreement show a high negative correlation. As with Set 1, naming latency correlates with both measures of name agreement (H and %) and indicates that it takes less time to name pictures that have a high degree of name agreement.

To summarize, our findings for Set 2 are very similar to those for Set 1. The young children are less accurate than older children and adults in naming Set 2 pictures. The high rate of naming failure suggests that this set includes a large number of pictures that are less familiar to

the young children.

Insert Table 5 about here

New pictures (Set 3)

There are only four pictures in Set 3 for which the concept names we identified are slightly different from the modal names given by the adults (see Table 2 in Appendix B). These concepts are 'koala', 'peas', 'ray' and 'rosebud' in which subjects named 'koala bear', 'pea pod', 'manta ray' and 'rose'. One third of the subjects did not recognize the picture of the calipers, and an additional eight did not know its name. Six percent of the responses were DKO and DKN responses. The failure rate in Snodgrass and Vanderwart is smaller, only 1.7%, and most likely reflects the high degree of familiarity engendered by that picture set, which represents objects that are more common than those in Set 3. A small number of the alternative names given for Set 3 items are considered failures because they do not have any relationship to the concepts. Some examples of failures are potato for jellyfish and garage for harmonica.

The young children provided modal names that differed from those provided by adults for 28 of the pictures (35% of the concepts, See Table 1 in Appendix B, items 322-400). One picture, that of an anvil, was not recognized by any child and therefore has no modal name for this age group. The other 27 pictures with different modal names include one synonym (panda bear for panda), eight superordinates and 11 coordinates. The modal name for the picture of the skull was 'skeleton'. In our analysis scheme this is considered a component name (part of). In addition, six pictures received modal names that are considered failures: 'egg' for avocado, 'belt' for calipers, 'clock' for compass, 'wheel' for cymbal, 'needle' for dart, and 'bat' for ray. In these

failures, names of objects that are visually, and sometimes also semantically, similar to the concept are assigned by the children. The DKO and DKN categories account for 27 percent of the responses. The nondominat names provided by children and adults are presented, respectively, in Tables 1 (items 322-400) and 2 of Appendix C.

Insert Table 6 about here

Table 6 shows the summary statistics for both adults and young children for the 79 pictures. For the adults, the 79 concepts produced lower name agreement than did the Snodgrass and Vanderwart (1980) pictures, but picture Set 3 yielded higher name agreement than did the Berman et al., (1989) pictures (Set 2). However, the 79 pictures (of Set 3) were rated less familiar and visually more complex than the pictures in the other two sets. This result is consistent with the word frequency count, which, for the adults, has a mean of 7.54 occurrences per million in Set 3, much lower than the other two sets (37.17 for Set 1, and 14.18 for Set 2). This may be due to the fact that Set 3 included a large number of less common animal pictures from the categories of mammals, birds, insects and sea creatures. These concepts (e.g., armadillo, scorpion) were not as typical of their categories as those in the other two sets, and were included because they had been used in our laboratory as fillers in a variety of memory tasks (e.g., Kazmerski & Friedman, submitted).

Although Set 3 includes pictures that are less familiar and more complex than pictures in Sets 1 and 2, for the adults only the familiarity measure correlates with name agreement (see Table 7, top). Naming latency shows substantial correlations with both measures of name agreement and with familiarity. This again supports the notion that more familiar pictures elicit a

higher percentage of name agreement and faster naming latency.

As can be seen in Table 6, both measures of name agreement indicate significantly less agreement among the young children than among adults ($p<0.001$). The young children also rate the pictures as less familiar than adults ($p<0.001$). However, both groups rate the visual complexity of the pictures similarly. Word-length for young children's modal names is significantly shorter than that for adults ($p<0.005$), which again appears to reflect the fact that six year old children's vocabulary consists of short words. The correlations among the measures for the children are presented in Table 7 (bottom). As expected, the two measures of name agreement correlate with one another. In addition, naming latency correlates with each of the name agreement measures, and also with visual complexity. Although adults show a significant correlation between familiarity and percentage name agreement, this correlation is not significant for the young children.

Insert Table 7 about here

In summary, picture Set 3 includes items that are less familiar to both adults and young children compared to Set 1, which is reflected in lower name agreement measures. The young children, however, produced many more alternative names than the adults, resulting in a mean percentage of name agreement that does not even reach 50 percent. Nevertheless, pictures from this set could be used when stimulus materials with low familiarity ratings are needed or when the study requires knowledge of the concept's category but not its name.

Comparison of the three sets for the young children

Measures from each data set were compared against those from the other sets to determine whether inherent differences existed among the three picture sets. Differences in name agreement are most dramatic between Set 1 (H=0.88, %=72) and either Set 2 (H=1.56, %=48) or Set 3 (H=1.71, %=43). Results of two tailed t-tests reveals significant differences between Set 1 and each of the other two sets for both measures of name agreement ($p<0.001$). There is no significant difference between Set 2 and Set 3.

Although the two measures of name agreement correlate, they reflect slightly different aspects of the data. The H statistic represents the degree of variability among the names that are given to each concept. Sets 2 and 3 contain a relatively high percentage of concepts that elicit multiple names. Multiple names can exist for various reasons: 1) a concept can have more than one name, such as "gun," "pistol," and "revolver," 2) the subject may name the pictures inaccurately; and 3) the drawing may not reflect accurately the concept it was intended to depict. An attempt was made to assess which of these alternatives may have produced name divergence in each of the three sets. The 3 sets do not differ in the percentage of synonym names (3.12, 5.03, and 3.08 for Sets 1, 2, and 3, respectively). The major difference is in the percentage of names that are considered failures, Set 1 having fewer failures (3.26%) than Sets 2 and 3 (7.87% and 10.76%, respectively). The percentage of name agreement takes into account DKO and DKN responses and therefore gives some indication of the recognizability of a picture by the subject. It is clear that Sets 2 and 3 include pictures that are unrecognized by a relatively large number of young children compared to Set 1. There are two possible reasons for the low recognition of the pictures by young children. One reason is that these pictures are less familiar, a fact that can be verified by the familiarity ratings and by the word frequency count. Comparing

the familiarity ratings of the three sets reveals a significant difference between Sets 1 and 3 only ($p<0.001$). As mentioned previously, Set 3 includes unusual animals and other less common objects, such as an anvil, that are especially atypical in the children's experience. For some pictures, such as stethoscope, children were familiar with the concept yet they could not assign a correct name. Pictures in Sets 1 and 3 also differ in their word frequency counts for modal names assigned by adults ($p<0.002$). This is taken as additional evidence of a difference in familiarity between the pictures in these sets. There was no such difference between Sets 1 and 2. Thus, it seems that a difference in concept familiarity plays the largest role in accounting for the disparity in name agreement between Sets 1 and 3.

The second reason for the low values in percent agreement is that complicated and detailed pictures are more difficult for children to identify. Examples of such pictures are the pinball machine, thermos and headphones. Those concepts are not completely absent from the young children's environment, but their representation in the drawings may be relatively unclear. Supporting this notion, there was a significant difference between the ratings of visual complexity between Sets 1 and 2 only ($p<0.017$). Set 2 includes pictures from the PPVT-R (Peabody Picture Vocabulary Test-Revised), some of which differ in drawing style from those appearing in Set 1. Some of these pictures depict scenes containing background objects in addition to the main concept. For example, one picture shows a fern set against a background of a rock. For this picture, some children identified the rock rather than the fern.

The non-modal names that children provided for the pictures from Sets 2 and 3 are mostly of the coordinate and superordinate classes. The other classes -- synonym, subordinate and component -- account for a smaller proportion of the alternative names. Thus, although there are more alternative names given to concepts in Sets 2 and 3 compared to Set 1, their

distribution among the classes is similar across all sets.

As mentioned previously, the picture naming process is assumed to involve at least three stages. In the first stage of object identification, only the physical description of the object is retrieved. In the second stage, name activation, the semantic features of the object are accessed, and in the response generation stage, the picture name is retrieved and pronounced. In an alternative model with four stages the name activation stage includes two separate representations, structural and semantic (Humpreys et al. 1988). The children's naming errors, which were mostly coordinates of and visually similar to the depicted objects, may have occurred during any of the three or, alternatively, the four stages. Children may have misidentified the objects depicted by the pictures (first stage), may have made semantic errors by accessing the meaning (or name) of structurally and/or semantically similar objects (second stage or, alternatively, second and third stages in the four stage model), or may have been confused in searching for the names (third stage or, alternatively, fourth stage). When the alternative names are not coordinates, as in Johnson's (1992) study, then it is possible that naming errors reflect problems with the name activation and response generation stages, rather than the identification stage.

The relationship among the variables in each set can also provide evidence on the degree of similarity among the pictures sets. To examine these relationships, factor analyses were performed and, for comparison purposes, the same procedures described by Berman et al. (1989) were followed. A three factor solution with varimax rotation was generated using pair-wise deletion of cases with missing data. For each picture set the factor analysis was performed with the picture as the unit of measurement (260 for Set 1, 61 for Set 2, and 79 for Set 3). Each picture was associated with the six variables described above, with each variable reflecting the

mean score of the number of subjects that entered into the computation (a maximum of 30 subjects). Table 8 presents the factor loadings between each factor and the six variables that were used for the three sets for the data of the young children. As can be seen, for all sets, factor one represents the contribution of the two measures of name agreement, whereas only Set 1 shows a contribution of familiarity. For all sets, the second factor represents the measures of word frequency and word length, which characterize the lexical aspects of the picture. In Sets 1 and 3, the third factor is dominated by a contribution from visual complexity with a smaller concept familiarity component. In addition, the loadings of visual complexity and familiarity were of opposite sign for Sets 1 and 3, which indicates that for these sets *high* familiarity ratings are associated with *low* visual complexity ratings. However, Set 2 revealed an equal (and same direction) contribution of familiarity and complexity to the third factor. This is consistent with the fact that the visual complexity ratings of Sets 1 and 3 and Set 2 differed (see above). As mentioned earlier, the pictures in Set 2 were taken from the PPVT-R, and their drawing style is different (more detailed) than those in Sets 1 and 3. Thus, for Set 2, familiar concepts also tended to be rated as visually complex.

Insert Table 8 about here

Although the three sets show a similar pattern of interaction among the variables, comparing these results to the factor analysis for adults reveals some differences. The factor loadings of the six variables for Set 3 of the adult data are presented in Table 9. As for the factor loadings of the young children (Table 8), factor 1 represents the contribution from the name agreement measures. However, familiarity also contributes to this factor. Factor 2 shows a

contribution primarily from the word-count measure (K-F), and to a lesser extent from the familiarity measure. The third factor reflects the contribution of word length and visual complexity. These last two factors appear to load differently in the young children compared to the adults. It seems that the familiarity aspect of the picture in this set interacts with the name agreement measures for the adults but not for the young children.

Insert Table 9 about here

In summary, measures of name agreement, familiarity and visual complexity for young children differ among sets. Set 1 has the highest name agreement, Set 2 includes pictures that are more visually complex, and Set 3 contains pictures that are the least familiar. Nevertheless, factor analyses of each of the three sets yielded highly similar factor structures. For each set, the first factor shows a contribution from the name agreement measures, the second factor from the lexical aspects of the pictures, and the third factor from both the familiarity and the visual complexity measures. These data suggest that the impact of these measures on naming performance is similar across all three sets. Because no reliability data were collected in the present study, one might question the stability of the judgments of familiarity and visual complexity. However, as the factor analyses indicate, the interactions among the six variables were highly similar for the three picture sets. Moreover, the interactions among the six variables were highly similar for the young children of this study when compared to the older children of Berman et al. (1989). These data thus provide some evidence for the consistency and the replicability of the measures.

Significance of the normative data for future research

Based on their SES scores, the children who participated in the present study were mostly from middle class backgrounds, and thus the data presented should be useful in most studies with children. However, the data might not be applicable in research with children from more widespread socio-economic backgrounds.

The measures of name agreement, familiarity and visual complexity are essentially independent and may be assumed to affect different stages during picture processing tasks. Thus, each should be considered in designing research studies involving pictures. For example, in studies where the task is to name the pictures, it is expected that children will incorrectly name pictures with low name agreement and familiarity (adults will be expected to show an increase in latency). The measure of familiarity in this case is similar to that of word frequency. In contrast, in studies of memory for pictures, performance will probably be affected by the visual complexity of the pictures. Consistent with this, Bevan and Steger (1971) reported superior recall for complex pictures compared to simple pictures. However, Pesdek and Chen (1982) found that recognition memory for simple pictures was better than for complex pictures.

These normative data have been used to choose pictures for a study of the development of implicit memory (Cycowicz & Friedman, 1994). Implicit memory is exhibited by an increase in a subject's skill in processing a previously presented stimulus. In this study, children aged 5-6, 9-10, adolescents (14-16) and young adults (20-30) were recruited and implicit memory was assessed using a picture-fragment completion task. Subjects viewed a series of fragmented pictures in increasing degrees of completion and were asked to identify the concept by *naming* it. Cycowicz and Friedman (1994) were able to demonstrate an age-related increase in implicit memory performance. However, because pictorial concepts had been chosen based on the norms

described here, Cycowicz and Friedman (1994) were better able to conclude that they had indeed demonstrated an age-related improvement in implicit memory that was not simply due to the young children's lack of particular concepts in their semantic memory.

In summary, the present study shows that young children name pictures differently than older children and adults. There are also differences among the groups in their rating of picture familiarity and, to a lesser extent, in visual complexity. A large number of pictorial stimuli have been provided whose properties have been quantified for both adults and young children. It is expected that these norms will be useful in future developmental research involving pictorial processing across a wide age range.

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Table 1:

Summary Statistics for Adults (AD), Older Children (CH), and Young Children (YC) for Picture Set-1.

	Name Agreement H			Name Agreement %			Familiarity			Visual Complexity			Word Length			Word	A-A	Latency
	AD	CH	YC	AD	CH	YC	AD	CH	YC	AD	CH	YC	AD	CH	YC	Frequency		(Sec)
MEAN	0.56	0.57	0.88	86.47	83.65	72.15	3.29	3.03	2.68	2.96	2.72	3.04	5.99	5.79	5.69	99.60	3.89	3.35
S.D.	0.53	0.60	0.79	14.43	18.67	25.50	0.96	0.84	0.46	0.90	0.87	0.81	2.45	2.31	2.30	153.82	0.99	1.08
N	260	259	260	260	259	260	260	259	260	260	259	260	260	259	260	248	250	260
MEDIAN	0.42	0.34	0.75	90.00	92.50	76.83	3.32	3.05	2.67	2.93	2.60	2.67	5.00	5.00	5.00	54.70	3.82	3.16
Q1	0.12	0.00	0.21	79.00	72.50	50.00	2.49	2.30	2.34	2.28	2.05	2.38	4.00	4.00	4.00	13.10	3.13	2.51
Q3	0.87	0.95	1.40	98.00	97.50	96.67	4.09	3.75	3.00	3.59	3.45	3.78	7.00	7.00	7.00	107.90	4.55	3.98
IQR	0.75	0.95	1.19	19.00	25.00	46.67	1.60	1.45	0.66	1.31	1.40	1.40	3.00	3.00	3.00	94.80	1.42	1.47
MIN	0.00	0.00	0.00	33.00	25.00	6.67	1.18	1.50	1.59	1.00	1.10	1.07	3.00	2.00	2.00	0.00	2.03	1.74
MAX	2.55	2.58	3.25	100.00	100.00	100.00	4.90	4.60	4.00	4.78	4.65	4.62	14.00	13.00	13.00	987.10	7.13	9.09
SKEW	1.01	1.11	1.20	-1.37	-1.27	0.74	0.09	-0.04	1.02	0.02	0.24	3.94	0.97	0.98	2.00	1.31	1.06	1.24

Note: Data for AD and CH were taken from Snodgrass and Vanderwart, (1980) and Berman et al., (1989). Word Length = of the modal name; A-A = age of acquisition taken from Snodgrass and Yuditsky (in press); Latency = naming latency in seconds for young children; Q1 = 25th percentile; Q3 = 75th percentile; IQR = interquartile range; Skew = (Q3-Median)/(Median - Q1).

Table 2:

Correlations Among the Variables for the Young Children for Picture Set-1.

	H	%	F	CO	L	AH-3	A-A	Latency
H	--	-0.937*	-0.386*	0.206*	0.246*	-0.218*	0.506*	0.702*
%		--	0.425*	-0.242*	-0.244*	0.212*	-0.579*	-0.730*
F			--	-0.223*	-0.064	0.187*	-0.427*	-0.336*
CO				--	0.146	-0.070	0.307*	0.195*
L					--	-0.335*	0.363*	0.246*
AH-3						--	-0.396*	-0.217*
A-A							--	0.471*
Latency								--

Note: H = information statistic; % = percentage of name agreement; F = familiarity; CO = visual complexity; L = word length of modal name; AH-3 = word frequency; A-A = age of acquisition; Latency = naming latency in seconds. * $p < 0.01$

Table 3:

Percentage of Young Children's Responses in 14 Selected Categories for the Intended Name (adult modal name).

Category Name	N	INTEND	SYN	SUPOR	SUBOR	COMP	COOR	FAIL	DKN	DKO
4-footed-animals	30	78	4	0	1	0	11	0	5	1
Basic Level	4	98	0	0	3	0	0	0	0	0
Birds	9	62	1	6	0	0	22	0	9	3
Clothing	24	72	4	1	1	0	18	2	2	1
Fruits	11	75	0	2	0	0	13	3	4	4
Furniture	14	67	7	5	0	7	3	3	7	1
Human body parts	12	72	3	4	0	11	4	2	4	0
Insects	10	60	0	12	2	0	13	0	11	1
Kitchen utensil	19	60	7	5	1	5	14	2	4	3
Musical instruments	10	53	0	2	0	0	13	4	8	20
Tool	11	46	1	7	0	0	17	1	18	10
Toys	9	77	13	0	0	0	0	6	2	1
Vegetables	13	61	0	3	0	1	12	5	14	4
Vehicles	13	73	8	8	1	0	4	1	2	2

Note: N = number of examplars in each category, INTEND - intended name, SYN - synonyms, SUPOR - superordinates, SUBOR - subordinates, COMP - component includes 'part of', COOR - coordinates, FAIL - naming failure, DKN - don't know name, DKO - don't know object.

Table 4:

Summary Statistics for Adults (AD), Children (CH), and Young Children (YC) for Picture Set-2.

	Name Agreement H			Name Agreement %			Familiatrity			Visual Complexity			Word Length			Word	Latency
	AD	CH	YC	AD	CH	YC	AD	CH	YC	AD	CH	YC	AD	CH	YC	Frequency	(sec)
MEAN	1.10	1.29	1.55	67.44	61.39	47.59	2.82	2.74	2.56	3.04	3.16	3.30	7.23	6.71	6.56	84.68	4.60
S.D.	0.79	0.88	0.94	23.24	26.43	27.25	0.78	0.60	0.50	0.66	0.70	0.67	2.71	2.46	2.67	157.65	1.61
N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	54	61
MEDIAN	1.00	1.20	1.50	70.30	67.50	43.00	2.59	2.70	2.50	3.00	3.15	3.32	7.00	6.00	6.00	24.30	4.49
Q1	0.40	0.60	0.76	48.60	42.50	23.33	2.17	2.32	2.17	2.59	2.75	2.79	5.00	5.00	4.00	5.95	3.18
Q3	1.60	2.00	2.29	86.50	80.00	66.83	3.30	3.10	2.93	3.62	3.82	3.75	9.00	8.00	9.00	71.07	5.51
IQR	1.20	1.40	1.53	37.90	37.50	43.50	1.40	1.13	0.77	1.03	1.07	0.97	4.00	3.00	5.00	65.12	2.33
MIN	0.00	0.00	0.00	0.00	5.00	0.00	1.67	1.53	1.50	1.78	1.76	1.53	3.00	3.00	3.00	0.00	2.02
MAX	3.50	3.38	3.54	97.30	100.00	100.00	4.49	4.05	3.86	4.32	4.31	4.67	14.00	14.00	12.00	887.20	9.80
SKEW	0.74	0.31	1.08	-0.60	-0.24	1.21	0.68	0.38	1.30	-0.01	-0.20	0.81	0.54	0.73	1.50	2.55	0.78

Note: Data for AD and CH were taken from Berman et al., (1989). Word length = of the modal name; Latency = naming latency in seconds for young children; Q1 = 25th percentile; Q3 = 75th percentile; IQR = interquartile range; Skew = (Q3-Median)/(Median - Q1).

Table 5:

Correlations Among the Variables for the Young Children for Picture Set-2.

	H	%	F	CO	L	AH-3	Latency
H	--	-0.809*	-0.186	-0193	0.069	0.153	0.714*
%		--	0.216	0.001	-0.156	0.009	-0.738*
F			--	0.242	0.049	-0.109	-0.153
CO				--	0.368*	-0.137	-0.037
L					--	-0.300*	0.270
AH-3						--	-0.024
Latency							--

Note: H = inforamtion statistic; % = percentage of name agreement; F = familiarity; CO = visual complexity; L = word length of modal name; AH-3 = word frequency; Latency = naming latency in seconds. * $p < 0.01$

Table 6:

Summary Statistics for Adults (AD), and Young Children (YC) for Picture Set-3.

	Name Agreement H		Name Agreement %		Familiarity		Visual Complexity		Word Length		Word Frequency		Latency (sec)	
	AD	YC	AD	YC	AD	YC	AD	YC	AD	YC	AD	YC	AD	YC
MEAN	0.95	1.71	73.18	43.41	3.72	2.48	3.19	3.21	6.73	6.14	7.54	46.40	3.66	4.32
S.D.	0.66	0.80	19.78	26.26	0.55	0.39	0.62	0.75	2.30	2.45	10.39	85.07	1.28	1.36
N	79	79	79	79	79	79	79	79	79	79	48	75	79	79
MEDIAN	0.90	1.80	76.67	40.00	3.83	2.46	3.23	3.33	7.00	6.00	4.00	19.03	3.32	4.10
Q1	0.42	1.17	56.67	23.00	3.33	2.28	2.70	2.64	5.00	4.00	2.00	5.95	2.72	3.41
Q3	1.44	2.28	90.00	66.67	4.17	2.73	3.67	3.80	8.00	8.00	10.00	46.38	4.25	5.08
IQR	1.02	1.11	33.33	43.67	0.84	0.45	0.97	1.16	3.00	4.00	8.00	40.44	1.52	1.66
MIN	0.00	0.00	23.33	0.00	1.90	1.00	1.45	1.44	3.00	3.00	1.00	0.00	2.09	2.18
MAX	2.48	3.27	100.00	96.67	4.60	3.60	4.48	4.74	14.00	14.00	64.00	486.40	8.98	9.80
SKEW	1.12	0.77	0.67	1.57	0.68	1.49	0.81	0.68	0.50	1.00	3.0	2.09	1.56	1.42

Note: Word length = of modal name; Latency = naming latency in seconds; Q1 = 25th percentile; Q3 = 75th percentile; IQR = interquartile range; Skew = (Q3-Median)/(Median - Q1).

Table 7:

Correlations Among the Variables for Picture Set-3 for Adults (AD) and for Young Children (YC).

	H	%	F	CO	L	K-F	Latency
				Adults			
H	--	-0.907*	-0.256	0.080	0.004	0.185	0.646*
%		--	0.445*	0.016	0.004	-0.041	-0.688*
F			--	-0.018	0.036	0.272	-0.617*
CO				--	0.229	0.094	-0.027
L					--	-0.230	0.051
K-F						--	0.025
Latency							--
				Young Children			
H	--	-0.864*	0.053	-0.193	-0.052	-0.100	0.525*
%		--	0.017	0.202	0.075	0.125	-0.622*
F			--	-0.100	0.232	-0.163	0.050
CO				--	0.013	-0.081	-0.271*
L					--	-0.206	-0.031
AH-3						--	-0.093
Latency							--

Note: H = information statistic; % = percentage of name agreement; F = familiarity; CO = visual complexity; L = word length of modal name; AH-3 = word frequency; Latency = naming latency in seconds. * $p < 0.01$

Table 8:

Factor Analysis of the Young Children's Data for Picture Sets 1, 2 and 3.

	Set - 1			Set - 2			Set - 3		
Variables	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**
H	-0.94	0.18	0.01	0.93	0.11	-0.13	-0.96	-0.01	-0.09
%	0.94	-0.17	-0.06	-0.93	0.10	0.07	0.96	0.06	0.06
F	0.60	-0.00	-0.31	-0.20	0.11	0.77	0.05	0.41	-0.60
CO	-0.14	0.08	0.96	0.01	-0.34	0.74	0.16	0.16	0.84
AH - 3	0.13	-0.79	0.03	0.17	0.83	0.08	-0.02	-0.75	-0.02
L	0.29	0.82	0.12	0.03	-0.72	0.31	0.03	0.80	-0.06

Note: H = information statistic; % = percentage of name agreement; F = familiarity; CO = visual complexity; L = word length of modal name; AH-3 = word frequency.

Table 9:

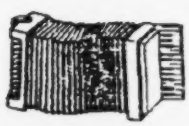
Factor Analysis of the Adult data for Picture Set-3.

	Set - 3		
Variables	**Factor 1**	**Factor 2**	**Factor 3**
H	-0.94	0.14	0.07
%	0.97	0.07	0.02
F	0.52	0.59	0.09
CO	-0.07	0.22	0.79
K-F	-0.15	0.90	-0.07
L	0.06	-0.30	0.77

Note: H = information statistic; % = percentage of name agreement; F = familiarity; CO = visual complexity; L = word length of modal name; K-F = Kucera Francis word frequency count (1967).

Appendix A

A total of 400 pictures, arranged in 3 sets, are shown below with their identifying number, Set 1 is presented 1-260, set 2 is presented 261-321, and set 3 is prsented 322-400. Within each set the pictures are arranged alphetically according to their intended name. The names for each picture and their norms shown in appendix B.

1 

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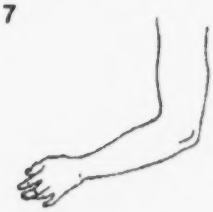
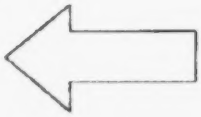
7 

8 

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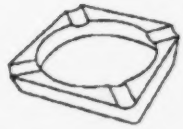
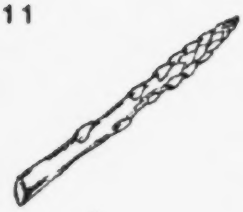
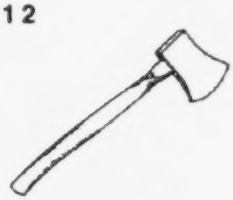
10 

11 

12 

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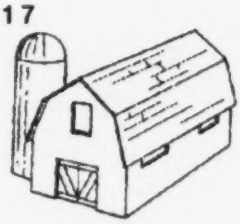
17 

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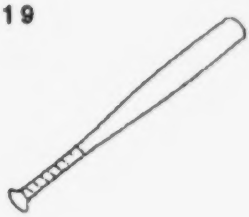
19 

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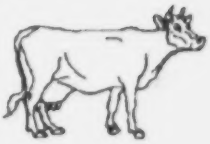
68 

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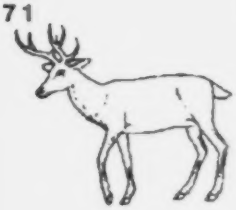
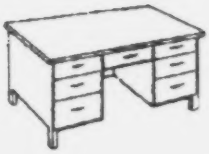
71 

72 

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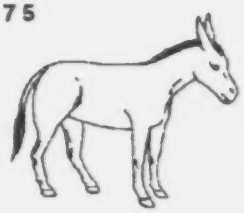
75 

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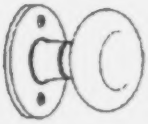
77 

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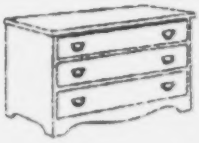
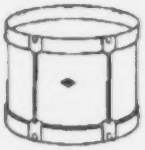
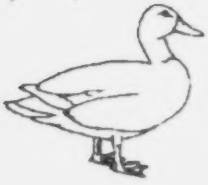
79 

80 

81 

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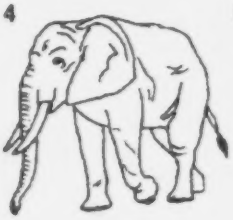
84 

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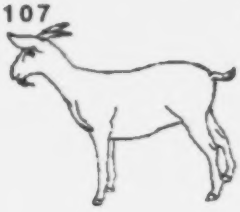
107 

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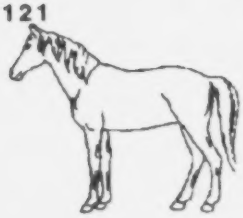
121 

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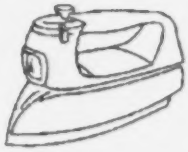
123 

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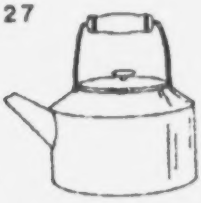
127 

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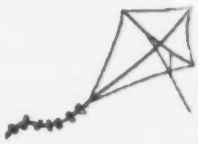
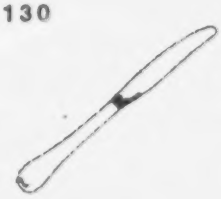
129 

130 

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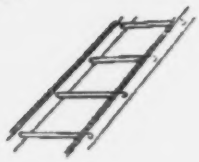

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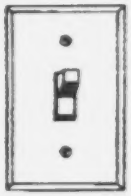

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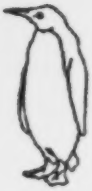
169 

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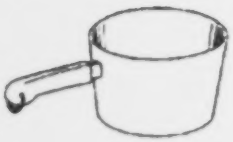
179 

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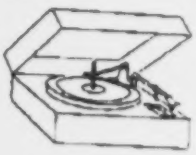
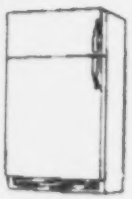
184 

185 

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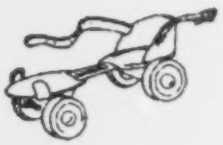
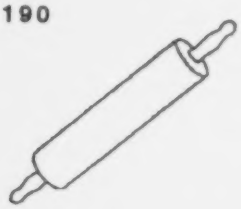
189 

190 

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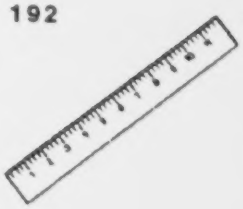
192 

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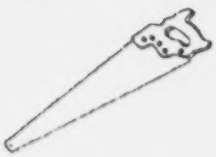
196 

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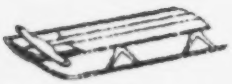
207 

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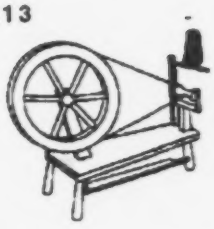
213 

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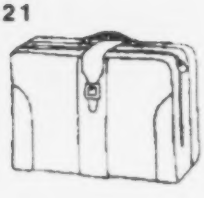
221 

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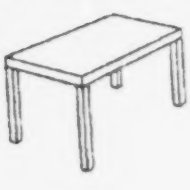
226 

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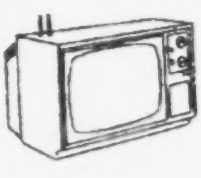
228 

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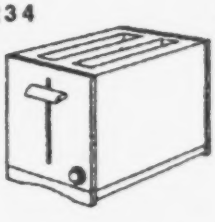
234 

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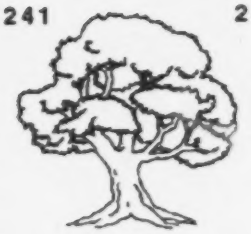
241 

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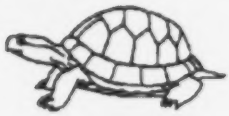
244 

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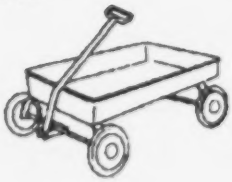
249 

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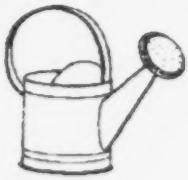
251 

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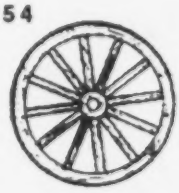
254 

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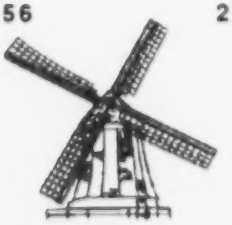
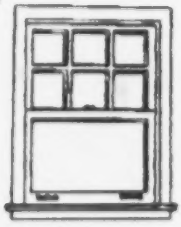
256 

257 

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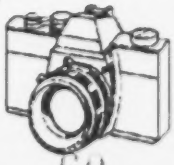
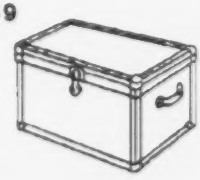
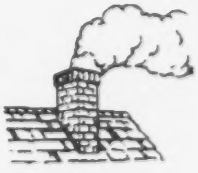
268 

269 

270 

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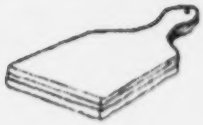

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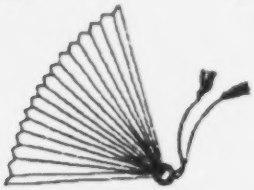

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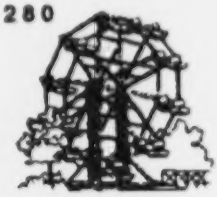

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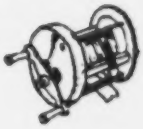

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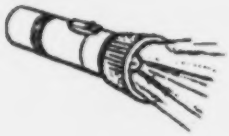

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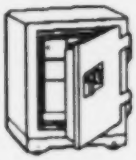

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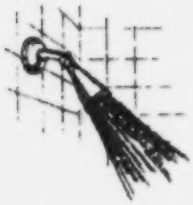

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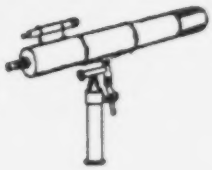

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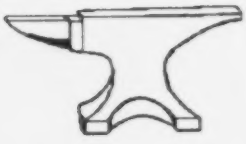

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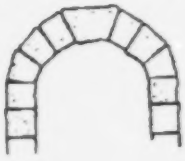

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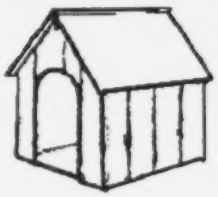

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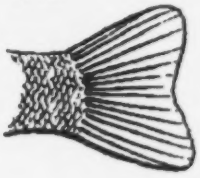

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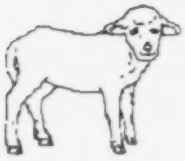

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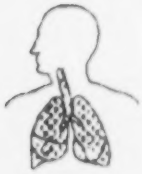

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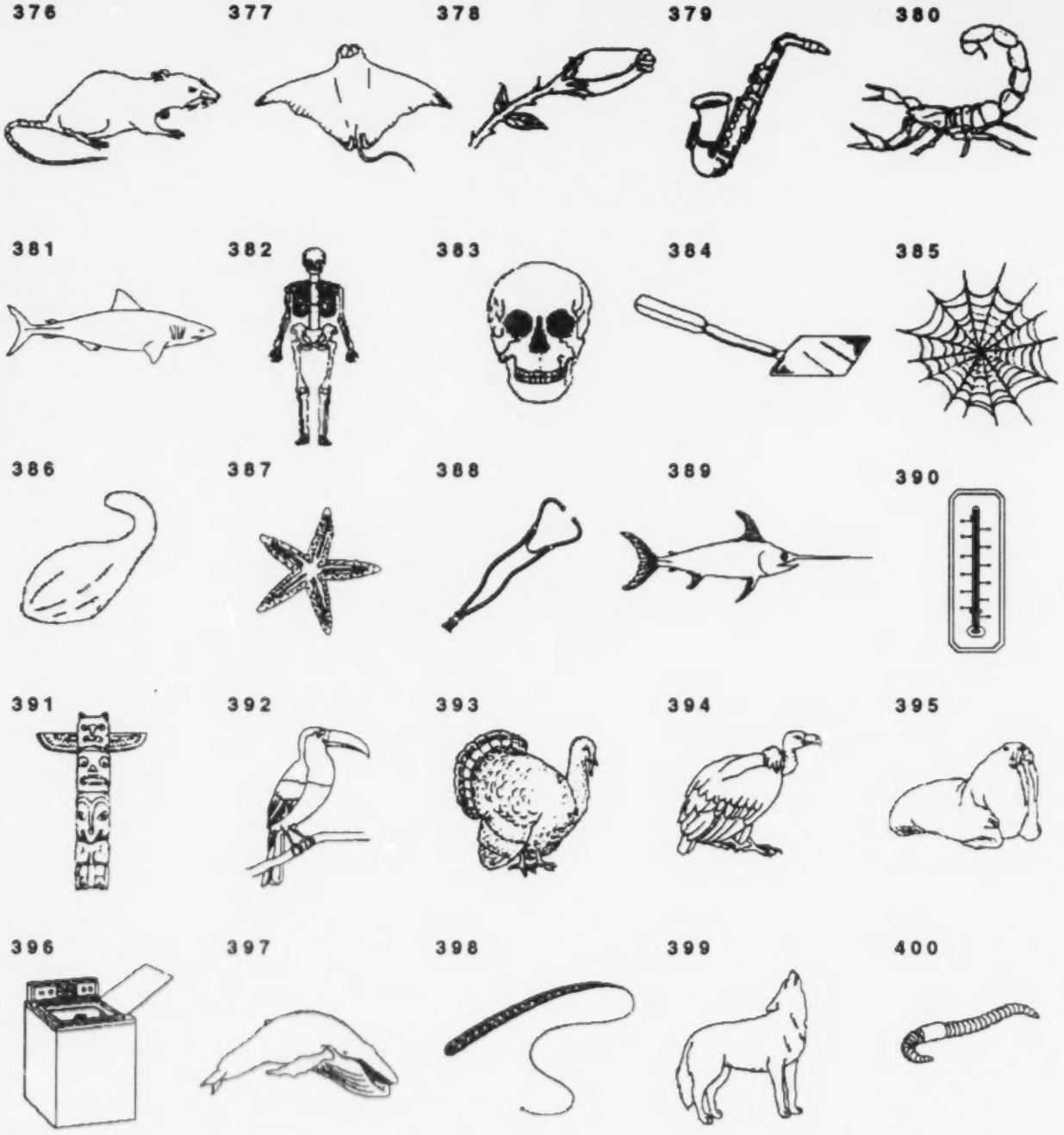

1 From Snodgrass & Vanderwart (1980), *Journal of Experimental Psychology: Human Learning and Memory,* 6(2), 174-215, reprinted by permission of the authors and Life Science Associates.

2 From Berman et al. (1989), *Behavior Research Methods, Instruments and Computers,* 21(3), 371-382, reprinted by permission of the authors, the Psychonomic Society, Inc., and American Guidance Service, Inc.

Appendix B

The following Tables (1) presents the data of the 5-7 year old children for picture sets 1, 2, and 3. Table 2 presents the data of young adults for picture set 3. The item number corresponds to the picture number that appears in Appendix A.

Table-1: *Young Children Picture Norms*

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
1	ACCORDION	ACCORDION	1.77	20	2.19	1.69	4.26	1.38	9	1.19
2	AIRPLANE	AIRPLANE	0.85	80	3.33	1.90	3.60	1.75	8	85.60
3	ALLIGATOR	ALLIGATOR	1.39	60	1.80	1.54	4.13	1.55	9	15.50
4	ANCHOR	ANCHOR	0.90	43	2.14	1.74	3.10	1.95	6	3.60
5	ANT	ANT	1.36	50	2.31	1.59	3.85	1.62	3	92.80
6	APPLE	APPLE	1.79	100	3.20	1.77	2.33	1.60	5	115.40
7	ARM	*HAND*	1.45	50	3.07	1.93	2.20	1.71	4	410.30
8	ARROW	ARROW	0.00	100	2.67	1.90	1.33	1.06	5	59.50
9	ARTICHOKE	ARTICHOKE	3.25	7	3.13	2.00	2.75	1.91	9	0.00
10	ASHTRAY	*HOLE*	1.79	10	2.67	1.97	2.00	1.67	7	0.00
11	ASPARAGUS	ASPARAGUS	2.31	20	2.68	1.92	3.21	1.87	9	0.00
12	AXE	AXE	1.10	63	1.96	1.60	2.19	1.69	3	3.60
13	BABY CARRIAGE	CARRIAGE	1.33	67	2.53	1.87	4.07	1.46	8	32.10
14	BALL	BALL	0.00	100	3.53	1.74	2.40	1.75	4	338.90
15	BALLOON	BALLOON	0.00	100	3.20	1.77	1.40	1.10	7	116.50
16	BANANA	BANANA	0.00	100	2.80	1.85	1.87	1.46	6	11.90
17	BARN	BARN	2.23	37	2.79	1.75	3.64	1.64	4	122.50
18	BARREL	BARREL	1.32	40	1.59	1.18	3.35	1.90	6	13.10
19	BASEBALL BAT	BAT	0.75	73	2.93	1.93	1.87	1.46	3	80.87
20	BASKET	BASKET	0.00	97	2.52	1.82	2.72	1.83	6	107.00
21	BEAR	BEAR	0.59	80	2.50	1.77	3.93	1.59	4	201.00
22	BED	BED	0.00	100	3.73	1.78	2.67	1.75	3	254.50
23	BEE	BEE	1.43	66	1.93	1.72	4.13	1.63	3	64.20
24	BEETLE	*BUG*	2.78	23	1.78	1.57	3.87	1.69	3	17.84
25	BELL	BELL	0.00	100	2.67	1.75	3.00	1.74	4	124.90
26	BELT	BELT	0.69	83	2.79	1.80	2.17	1.73	4	26.20
27	BICYCLE	*BICYCLE*	0.78	77	3.20	1.77	4.27	1.44	7	64.22
28	BIRD	BIRD	0.63	90	3.07	1.86	4.07	1.46	4	344.92
29	BLOUSE	*SHIRT*	1.65	43	2.67	1.83	3.27	1.72	5	30.90
30	BOOK	BOOK	0.00	100	3.73	1.78	2.40	1.67	4	300.90
31	BOOT	BOOT	0.21	97	2.07	1.55	3.00	1.82	4	9.50
32	BOTTLE	BOTTLE	0.83	87	2.53	1.80	2.33	1.69	6	108.20
33	BOW	BOW	0.77	87	2.87	1.96	2.53	1.87	3	55.90
34	BOWL	BOWL	0.21	97	2.53	1.80	2.27	1.53	4	142.70
35	BOX	BOX	0.21	97	2.20	1.63	1.60	1.30	3	449.50
36	BREAD	BREAD	0.63	90	3.13	1.89	1.93	1.55	5	167.70
37	BROOM	BROOM	0.00	100	2.40	1.75	2.67	1.75	5	9.50

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Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
38	BRUSH	BRUSH	0.21	97	2.80	1.77	3.13	1.81	5	58.30
39	BUS	BUS	0.35	93	3.33	1.83	3.47	1.87	3	135.60
40	BUTTERFLY	BUTTERFLY	0.00	100	3.27	1.80	2.87	1.89	9	33.30
41	BUTTON	BUTTON	0.42	93	2.93	1.86	1.20	0.61	6	135.60
42	CAKE	CAKE	0.21	97	3.93	1.55	2.73	1.72	4	99.90
43	CAMEL	CAMEL	0.00	90	2.17	1.81	3.90	1.65	5	23.80
44	CANDLE	CANDLE	0.21	97	3.27	1.87	2.20	1.71	6	38.10
45	CANNON	CANNON	1.06	40	3.20	1.82	3.40	1.79	6	8.30
46	CAP	***HAT***	1.29	60	2.72	1.83	2.72	1.75	3	237.85
47	CAR	CAR	0.00	100	3.33	1.75	3.73	1.62	3	482.80
48	CARROT	CARROT	0.00	97	3.07	1.86	1.93	1.46	6	35.70
49	CAT	CAT	0.00	100	3.00	1.89	3.80	1.63	3	352.00
50	CATERPILLAR	CATERPILLAR	1.42	47	2.43	1.80	3.00	1.90	11	40.40
51	CELERY	CELERY	2.20	30	2.25	1.65	3.25	1.98	6	8.30
52	CHAIN	CHAIN	0.00	93	2.71	1.86	2.43	1.71	5	17.80
53	CHAIR	CHAIR	0.00	100	2.87	1.74	2.27	1.78	5	92.80
54	CHERRY	***APPLE***	1.88	37	2.63	1.92	2.19	1.78	5	111.79
55	CHICKEN	CHICKEN	1.89	50	1.97	1.57	4.10	1.57	7	90.40
56	CHISEL	**SCREW DRIVER**	1.42	27	2.29	1.86	3.71	1.68	11	2.38
57	CHURCH	***HOUSE***	1.47	47	2.38	1.86	3.41	1.80	5	933.57
58	CIGAR	CIGAR	2.14	27	1.96	1.69	2.13	1.79	5	4.80
59	CIGARETTE	CIGARETTE	0.96	60	2.04	1.80	1.61	1.27	9	2.40
60	CLOCK	CLOCK	0.00	100	2.73	1.80	2.93	1.86	5	99.90
61	CLOTHESPIN	***CLIP***	1.46	47	2.17	1.73	3.48	1.82	4	5.95
62	CLOUD	CLOUD	2.78	37	2.91	1.86	2.91	1.86	5	95.10
63	CLOWN	CLOWN	0.21	97	2.93	1.86	3.53	1.81	5	49.90
64	COAT	COAT	1.58	50	2.20	1.79	2.67	1.90	4	107.00
65	COMB	COMB	0.47	90	2.93	1.93	2.73	1.87	4	5.90
66	CORN	CORN	0.00	100	3.07	1.93	3.33	1.83	4	227.10
67	COUCH	COUCH	0.48	87	3.00	1.93	3.00	1.85	5	3.60
68	COW	COW	0.23	87	2.70	1.81	3.89	1.60	3	110.60
69	CROWN	CROWN	0.43	90	3.47	1.87	3.13	1.89	5	15.50
70	CUP	CUP	0.72	80	2.67	1.83	2.47	1.74	3	80.90
71	DEER	DEER	0.51	70	2.77	1.90	3.92	1.81	4	90.40
72	DESK	DESK	1.27	67	3.07	1.89	3.41	1.64	4	88.00
73	DOG	DOG	0.00	100	3.47	1.87	3.80	1.63	3	544.70
74	DOLL	DOLL	1.74	50	2.60	1.85	3.13	1.74	4	90.40
75	DONKEY	DONKEY	1.18	70	2.60	1.85	3.60	1.75	6	88.00
76	DOOR	DOOR	0.00	100	2.60	1.85	2.80	1.92	4	529.20
77	DOORKNOB	DOORKNOB	2.42	37	2.52	1.89	3.00	1.90	8	5.90
78	DRESS	DRESS	0.79	83	2.45	1.84	2.24	1.64	5	147.50
79	DRESSER	***DRAWER***	2.59	27	2.33	1.84	3.87	1.55	6	4.76
80	DRUM	DRUM	0.37	87	2.10	1.65	3.00	1.77	4	49.90
81	DUCK	DUCK	0.42	93	2.67	1.83	3.60	1.59	4	165.30
82	EAGLE	***BIRD***	1.75	30	2.77	1.82	4.31	1.38	4	337.75
83	EAR	EAR	0.00	100	2.67	1.90	4.00	1.64	3	71.40
84	ELEPHANT	ELEPHANT	0.00	100	2.93	1.93	4.00	1.64	8	67.80
85	ENVELOPE	ENVELOPE	1.25	60	2.93	1.93	2.20	1.63	8	15.50
86	EYE	EYE	0.42	93	3.13	1.81	3.20	1.77	3	124.90

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
87	FENCE	FENCE	0.88	70	1.93	1.55	3.07	1.86	5	104.70
88	FINGER	FINGER	0.56	90	2.67	1.90	1.87	1.55	6	107.00
89	FISH	FISH	0.00	100	2.93	1.93	3.13	1.89	4	516.10
90	FLAG	FLAG	0.00	100	3.13	1.81	1.67	1.32	4	65.40
91	FLOWER	FLOWER	0.00	100	3.20	1.85	2.40	1.83	6	77.30
92	FLUTE	FLUTE	1.34	43	2.00	1.72	2.91	1.80	5	13.10
93	FLY	FLY	1.62	57	1.62	1.42	4.17	1.56	3	317.50
94	FOOT	FOOT	0.42	93	3.33	1.83	2.60	1.69	4	152.20
95	FOOTBALL	FOOTBALL	0.81	80	3.07	1.92	2.14	1.67	8	17.80
96	FOOTBALL HELMET	HELMET	1.61	47	2.48	1.89	3.74	1.68	6	16.60
97	FORK	FORK	0.00	100	3.00	1.89	2.67	1.75	4	21.40
98	FOX	FOX	0.75	73	2.21	1.83	3.79	1.57	3	84.40
99	FRENCH HORN	*TRUMPET*	2.79	13	1.81	1.39	4.41	1.34	7	11.89
100	FROG	FROG	0.21	97	2.40	1.83	3.80	1.71	4	70.20
101	FRYING PAN	PAN	1.25	70	2.87	1.89	2.00	1.64	3	78.49
102	GARBAGE CAN	GARBAGE CAN	1.74	53	2.27	1.78	3.07	1.70	10	--
103	GIRAFFE	GIRAFFE	0.59	83	2.79	1.83	4.14	1.58	7	21.40
104	GLASS	*CUP*	0.95	63	2.80	1.92	2.13	1.72	3	80.87
105	GLASSES	GLASSES	0.35	93	2.67	1.97	2.27	1.53	7	53.50
106	GLOVE	GLOVE	0.98	73	2.87	1.89	2.53	1.80	5	13.10
107	GOAT	GOAT	1.66	60	2.07	1.59	4.00	1.59	4	82.10
108	GORILLA	GORILLA	1.18	70	2.47	1.81	4.13	1.46	7	0.00
109	GRAPES	GRAPES	0.00	100	3.27	1.95	2.53	1.80	6	13.10
110	GRASSHOPPER	GRASSHOPPER	2.79	27	1.89	1.60	4.19	1.59	11	9.50
111	GUITAR	GUITAR	0.39	80	2.87	1.81	3.27	1.72	6	10.70
112	GUN	GUN	0.00	100	2.33	1.92	4.27	1.34	3	46.40
113	HAIR	HAIR	2.21	33	3.11	2.00	2.44	1.79	4	205.70
114	HAMMER	HAMMER	0.22	90	2.64	1.81	3.07	1.68	6	30.90
115	HAND	HAND	0.21	97	3.20	1.85	1.67	1.21	4	410.30
116	HANGER	HANGER	0.43	90	2.38	1.70	1.97	1.66	6	0.00
117	HARP	HARP	1.21	30	2.00	1.56	4.08	1.56	4	3.60
118	HAT	HAT	0.21	97	2.60	1.77	2.40	1.75	3	239.00
119	HEART	HEART	0.00	100	3.13	1.81	1.47	1.25	5	157.00
120	HELICOPTER	HELICOPTER	0.22	93	3.55	1.76	4.24	1.46	10	28.50
121	HORSE	HORSE	0.21	97	3.53	1.81	3.53	1.89	5	371.10
122	HOUSE	HOUSE	0.21	97	3.13	1.96	3.00	1.97	5	987.10
123	IRON	IRON	1.61	57	2.04	1.60	3.96	1.51	4	159.40
124	IRONING BOARD	IRONING BOARD	2.43	23	3.00	1.91	2.22	1.57	12	--
125	JACKET	JACKET	1.74	40	2.93	1.89	3.48	1.82	6	55.90
126	KANGAROO	KANGAROO	0.22	90	2.93	1.89	3.90	1.47	8	9.50
127	KETTLE	*TEAPOT*	2.45	33	2.50	1.86	3.79	1.66	6	10.70
128	KEY	KEY	0.00	100	3.33	1.83	3.33	1.67	3	123.70
129	KITE	KITE	0.00	97	3.00	1.85	2.79	1.80	4	30.90
130	KNIFE	KNIFE	0.22	93	2.72	1.91	2.31	1.79	5	28.50
131	LADDER	LADDER	0.00	100	2.27	1.62	2.13	1.72	6	40.40
132	LAMP	LAMP	0.87	77	2.67	1.90	2.80	1.92	4	59.50
133	LEAF	LEAF	0.21	97	2.47	1.81	2.93	1.78	4	72.50
134	LEG	LEG	1.34	53	2.53	1.87	2.73	1.72	3	86.80
135	LEMON	LEMON	1.23	73	2.20	1.71	2.20	1.63	5	10.70

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
136	LEOPARD	*TIGER*	2.19	30	2.15	1.71	3.77	1.80	5	40.43
137	LETTUCE	*CABBAGE*	2.83	20	2.43	1.80	3.38	1.86	7	112.98
138	LIGHT BULB	LIGHT BULB	1.21	70	2.79	1.72	2.79	1.80	9	- -
139	LIGHT SWITCH	LIGHT-SWITCH	1.85	33	2.50	1.77	2.43	1.62	11	- -
140	LION	LION	0.47	90	2.00	1.64	3.93	1.55	4	114.20
141	LIPS	LIPS	0.78	77	2.87	1.96	2.27	1.62	4	19.00
142	LOBSTER	LOBSTER	1.12	53	2.08	1.72	4.62	0.98	7	15.50
143	LOCK	LOCK	1.38	67	2.50	1.77	2.79	1.83	4	19.00
144	MITTEN	MITTEN	0.74	77	2.67	1.83	2.67	1.75	6	1.20
145	MONKEY	MONKEY	0.21	97	3.20	1.92	3.60	1.75	6	89.20
146	MOON	MOON	0.00	100	3.27	1.87	1.60	1.30	4	391.30
147	MOTORCYCLE	MOTORCYCLE	0.66	80	2.38	1.86	4.52	1.15	10	1.20
148	MOUNTAIN	MOUNTAIN	0.43	90	2.03	1.57	2.52	1.74	8	198.60
149	MOUSE	MOUSE	0.87	77	2.52	1.82	3.34	1.78	5	102.30
150	MUSHROOM	MUSHROOM	0.00	87	2.14	1.76	3.36	1.64	8	7.10
151	NAIL	NAIL	1.41	57	2.17	1.66	1.50	1.22	4	57.10
152	NAIL FILE	KNIFE	0.83	87	2.93	1.86	2.33	1.69	5	28.54
153	NECKLACE	NECKLACE	0.00	100	2.80	1.85	1.73	1.53	8	15.50
154	NEEDLE	NEEDLE	1.31	77	2.67	1.90	1.93	1.55	6	42.80
155	NOSE	NOSE	0.00	90	2.93	1.80	3.07	1.71	4	148.70
156	NUT	*SCREW*	2.45	17	3.47	1.50	2.41	1.70	3	4.76
157	ONION	ONION	1.34	63	1.80	1.63	2.92	1.78	5	7.10
158	ORANGE	ORANGE	1.04	77	2.79	1.95	1.90	1.57	6	80.90
159	OSTRICH	OSTRICH	2.03	37	2.09	1.60	4.00	1.48	7	20.20
160	OWL	OWL	0.22	93	1.83	1.47	4.03	1.66	3	84.40
161	PAINTBRUSH	PAINTBRUSH	0.56	90	3.00	1.74	2.07	1.64	10	3.60
162	PANTS	PANTS	0.21	97	2.53	1.87	1.87	1.55	5	15.50
163	PEACH	*ORANGE*	2.63	27	2.69	1.85	2.46	1.84	6	80.87
164	PEACOCK	PEACOCK	1.61	40	2.04	1.65	4.44	1.36	7	21.40
165	PEANUT	PEANUT	0.80	73	3.28	1.83	3.00	1.69	6	20.20
166	PEAR	PEAR	0.21	97	2.80	1.85	1.93	1.64	4	1.20
167	PEN	PEN	0.72	80	3.20	1.85	2.60	1.69	3	46.40
168	PENCIL	PENCIL	0.00	100	3.27	1.80	2.40	1.83	6	88.00
169	PENGUIN	PENGUIN	0.00	93	2.86	1.88	3.71	1.74	7	9.50
170	PEPPER	PEPPER	1.67	57	2.56	1.78	3.15	1.75	6	9.50
171	PIANO	PIANO	0.00	97	3.07	1.89	4.52	1.15	5	58.30
172	PIG	PIG	0.00	100	1.80	1.54	3.67	1.69	3	63.00
173	PINEAPPLE	PINEAPPLE	0.61	53	2.92	1.87	4.12	1.42	9	2.40
174	PIPE	PIPE	0.51	70	2.03	1.66	2.66	1.70	4	67.80
175	PITCHER	PITCHER	2.09	30	2.83	1.76	2.33	1.63	7	36.90
176	PLIERS	*TOOL*	1.31	23	2.44	1.78	3.48	1.66	4	13.08
177	PLUG	PLUG	1.04	70	2.33	1.60	3.13	1.81	4	10.70
178	POCKETBOOK	POCKETBOOK	1.40	53	2.07	1.64	3.47	1.72	10	3.60
179	POT	*PAN*	1.38	43	2.29	1.56	1.93	1.49	3	78.49
180	POTATO	POTATO	1.57	63	2.93	1.84	2.00	1.68	6	19.00
181	PUMPKIN	PUMPKIN	0.00	100	2.87	1.66	2.87	1.81	7	23.80
182	RABBIT	RABBIT	1.16	70	3.40	1.77	3.93	1.55	6	105.80
183	RACCOON	RACCOON	1.24	47	2.04	1.69	4.13	1.58	7	26.20
184	RECORD PLAYER	RECORD PLAYER	1.34	63	2.56	1.69	4.11	1.50	12	- -

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185	REFRIGERATOR	REFRIGERATOR	0.22	93	3.48	1.90	2.38	1.52	12	28.50
186	RHINOCEROS	RHINOCEROS	1.97	43	1.85	1.52	3.77	1.80	10	5.90
187	RING	RING	0.00	93	2.93	1.92	1.79	1.57	4	220.00
188	ROCKING CHAIR	ROCKING CHAIR	0.47	90	2.67	1.67	4.07	1.55	12	--
189	ROLLER SKATE	ROLLER SKATE	1.97	53	3.07	1.86	3.93	1.55	11	1.20
190	ROLLING PIN	ROLLING PIN	2.14	43	2.19	1.78	2.11	1.69	10	--
191	ROOSTER	ROOSTER	1.67	40	2.59	1.80	3.97	1.57	7	19.00
192	RULER	RULER	0.83	77	2.71	1.86	2.21	1.66	5	54.70
193	SAILBOAT	*BOAT*	1.11	70	2.73	1.72	3.87	1.46	4	190.28
194	SALT SHAKER	*SALT*	1.22	63	2.29	1.74	3.00	1.81	4	122.49
195	SANDWICH	SANDWICH	0.21	97	2.67	1.83	3.40	1.77	8	17.80
196	SAW	SAW	0.53	67	2.48	1.89	2.85	1.83	3	850.30
197	SCISSORS	SCISSORS	0.00	100	3.33	1.75	2.93	1.86	8	26.20
198	SCREW	*NAIL*	1.46	53	2.60	1.73	3.40	1.63	4	57.08
199	SCREWDRIVER	SCREWDRIVER	1.02	63	2.36	1.80	2.36	1.70	11	2.40
200	SEAHORSE	SEAHORSE	1.73	50	2.70	1.90	4.04	1.40	8	0.00
201	SEAL	SEAL	0.61	80	2.59	1.96	3.83	1.56	4	9.50
202	SHEEP	SHEEP	1.79	40	2.44	1.78	4.04	1.65	5	147.50
203	SHIRT	SHIRT	1.39	60	3.07	1.86	3.33	1.83	5	42.80
204	SHOE	SHOE	0.00	100	3.20	1.85	3.40	1.77	4	69.00
205	SKIRT	SKIRT	0.93	63	2.58	1.86	1.83	1.55	5	11.90
206	SKUNK	SKUNK	0.82	73	2.64	1.89	4.00	1.68	5	60.70
207	SLED	SLED	0.53	73	3.00	1.81	4.21	1.26	4	16.60
208	SNAIL	SNAIL	0.24	80	2.28	1.81	3.08	1.78	5	29.70
209	SNAKE	SNAKE	0.21	97	2.33	1.84	2.53	1.80	5	127.30
210	SNOWMAN	SNOWMAN	0.00	100	3.20	1.85	2.87	1.66	7	8.30
211	SOCK	SOCK	0.00	100	2.40	1.75	1.80	1.35	4	2.40
212	SPIDER	SPIDER	1.00	67	1.64	1.38	3.32	1.80	6	108.20
213	SPINNING WHEEL	SPINNING WHEEL	2.12	13	2.43	1.83	4.43	1.22	13	--
214	SPOOL OF THREAD	**THREAD**	2.66	23	2.00	1.62	4.00	1.72	6	83.20
215	SPOON	SPOON	0.00	100	2.60	1.77	2.20	1.71	5	22.60
216	SQUIRREL	SQUIRREL	0.58	83	3.07	1.89	3.97	1.48	8	41.60
217	STAR	STAR	0.00	100	3.40	1.85	2.13	1.72	4	122.50
218	STOOL	STOOL	1.53	47	2.40	1.75	2.67	1.90	5	10.70
219	STOVE	STOVE	1.35	50	3.00	1.82	4.07	1.55	5	54.70
220	STRAWBERRY	STRAWBERRY	0.43	90	3.00	1.85	2.86	1.85	10	9.50
221	SUITCASE	SUITCASE	0.56	90	3.00	1.89	3.87	1.55	8	4.80
222	SUN	SUN	0.35	93	3.27	1.87	1.07	0.37	3	726.60
223	SWAN	SWAN	1.31	57	2.93	1.84	3.29	1.78	4	20.20
224	SWEATER	*SHIRT*	1.78	50	2.93	1.86	2.87	1.89	5	42.81
225	SWING	SWING	0.37	87	2.93	2.00	2.57	1.91	5	61.80
226	TABLE	TABLE	0.21	97	2.53	1.87	1.67	1.32	5	350.80
227	TELEPHONE	TELEPHONE	0.57	87	3.20	1.77	4.27	1.34	9	72.50
228	TELEVISION	TV	0.78	77	4.00	1.72	3.73	1.78	2	60.60
229	TENNIS RACKET	TENNIS RACKET	1.04	77	2.60	1.77	3.20	1.85	12	--
230	THIMBLE	*CUP*	2.20	33	1.88	1.54	2.52	1.76	3	80.87
231	THUMB	THUMB	1.00	53	3.07	1.93	2.20	1.63	5	67.80
232	TIE	TIE	1.11	70	2.33	1.84	2.80	1.77	3	92.80
233	TIGER	TIGER	0.81	77	2.21	1.66	4.57	1.14	5	40.40

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
234	TOASTER	TOASTER	0.47	80	2.48	1.81	3.22	1.87	7	7.10
235	TOE	TOE	1.64	47	2.53	1.94	2.13	1.63	3	25.00
236	TOMATO	TOMATO	0.64	87	2.24	1.72	2.03	1.74	6	9.50
237	TOOTHBRUSH	TOOTHBRUSH	0.00	100	2.87	1.89	2.53	1.72	10	5.90
238	TOP	***DRIEDLE***	1.00	47	2.71	1.70	3.07	1.84	7	--
239	TRAFFIC LIGHT	TRAFFIC LIGHT	2.20	30	2.14	1.58	3.36	1.89	12	--
240	TRAIN	TRAIN	0.42	93	3.07	1.78	4.33	1.32	5	208.10
241	TREE	TREE	0.00	100	3.40	1.99	3.27	1.95	4	456.70
242	TRUCK	TRUCK	0.42	93	2.40	1.75	3.00	1.89	5	182.00
243	TRUMPET	TRUMPET	2.06	40	2.17	1.65	4.10	1.26	7	13.10
244	TURTLE	TURTLE	0.00	100	2.73	1.87	3.33	1.83	6	64.20
245	UMBRELLA	UMBRELLA	0.00	100	3.20	1.77	3.13	1.81	8	17.80
246	VASE	VASE	1.52	63	2.50	1.86	3.21	1.75	4	5.90
247	VEST	VEST	1.47	47	2.33	1.75	3.00	1.75	4	3.60
248	VIOLIN	***GUITAR***	1.34	50	2.60	1.77	4.40	1.30	6	10.70
249	WAGON	WAGON	0.00	77	2.48	1.72	3.30	1.90	5	165.30
250	WATCH	WATCH	0.21	97	3.53	1.74	2.93	1.86	5	304.50
251	WATERING CAN	WATERING CAN	2.70	20	2.52	1.90	3.28	1.67	11	--
252	WATERMELON	WATERMELON	1.02	77	3.33	1.75	1.93	1.36	10	5.90
253	WELL	WELL	0.00	80	2.36	1.81	3.57	1.87	4	817.00
254	WHEEL	WHEEL	0.22	93	2.59	1.80	2.17	1.65	5	80.90
255	WHISTLE	WHISTLE	0.00	97	2.72	1.91	3.21	1.72	7	42.80
256	WINDMILL	WINDMILL	1.19	40	1.88	1.45	4.25	1.44	8	13.10
257	WINDOW	WINDOW	0.35	93	2.67	1.83	3.07	1.86	6	308.00
258	WINE GLASS	***CUP***	0.99	77	3.27	1.87	2.20	1.63	3	80.87
259	WRENCH	WRENCH	1.67	37	2.11	1.78	2.56	1.78	6	5.90
260	ZEBRA	ZEBRA	0.00	97	2.38	1.70	4.17	1.56	5	4.80
261	ACORN	ACORN	1.43	50	1.88	1.54	2.52	1.76	5	1.20
262	BASIN	***BOX***	3.33	17	2.00	1.52	2.15	1.71	3	435.27
263	BENCH	BENCH	0.57	87	2.53	1.72	2.80	1.77	5	25.00
264	BINOCULARS	BINOCULARS	1.22	63	2.62	1.88	4.08	1.41	10	5.90
265	BIRD NEST	NEST	0.57	87	2.13	1.72	4.07	1.72	4	162.90
266	BIRD HOUSE	BIRD HOUSE	1.51	63	2.43	1.87	3.43	1.75	9	1.20
267	BLIMP	BLIMP	1.01	63	2.76	1.76	3.48	1.76	5	0.00
268	CAMERA	CAMERA	0.00	100	3.07	1.93	4.13	1.63	6	20.27
269	CHEST	***BOX***	2.78	37	2.63	1.76	2.78	1.60	3	435.30
270	CHIMNEY	CHIMNEY	1.67	57	2.00	1.46	2.67	1.83	7	13.10
271	CLOSET	CLOSET	0.63	90	2.53	1.87	3.53	1.81	6	22.60
272	COLANDER	***BOWL***	2.23	20	2.10	1.65	3.00	1.95	4	142.71
273	CUTTING BOARD	CUTTING BOARD	3.42	7	1.67	1.30	2.17	1.80	12	--
274	DOLPHIN	DOLPHIN	1.25	63	3.20	1.85	3.33	1.75	7	4.80
275	DUST PAN	DUST PAN	1.97	17	2.08	1.72	2.77	1.90	7	0.00
276	FAN	FAN	0.26	73	3.16	1.99	2.60	1.83	3	21.40
277	FAUCET	***SINK***	1.70	60	3.14	2.00	3.48	1.82	4	34.49
278	FEATHER	FEATHER	0.57	87	2.47	1.81	2.53	1.87	7	45.20
279	FERN	PLANT	2.30	43	2.17	1.55	2.67	2.01	5	334.10
280	FERRIS WHEEL	FERRIS WHEEL	1.56	40	3.08	2.00	4.67	0.96	11	--
281	FIRE HYDRANT	FIRE HYDRANT	0.47	30	1.81	1.59	3.81	1.69	11	--
282	FISHHOOK	HOOK	1.39	43	2.68	1.92	1.53	1.12	4	23.70

BEST COPY AVAILABLE

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
283	FISHING REEL		2.81	0	1.50	1.41	4.00	1.85	11	2.40
284	FLASHLIGHT	FLASHLIGHT	0.44	87	3.57	1.79	3.36	1.89	10	28.50
285	GLOBE	GLOBE	1.34	63	3.21	1.83	3.21	1.83	5	67.80
286	GOGGLES	*BINOCULARS*	0.94	53	2.48	1.63	3.67	1.66	10	5.95
287	GRILL	*BARBECUE*	2.62	27	2.76	1.94	3.32	1.80	8	2.40
288	GROCERIES	BAG	3.54	17	2.50	1.86	3.29	1.94	3	130.82
289	HEADPHONES	HEADPHONES	2.22	17	2.22	1.70	3.78	1.70	10	0.00
290	HIPPOPOTAMUS	*HIPPOPOTAMUS*	1.32	60	2.46	1.65	4.23	1.50	12	24.90
291	HOE	RAKE	1.95	27	2.00	1.67	2.17	1.66	4	15.46
292	LANTERN	*LAMP, LIGHT*	2.29	23	2.33	1.71	4.24	1.34	5	412.67
293	LAWNMOWER	LAWNMOWER	1.80	33	2.14	1.74	4.05	1.63	9	--
294	LOGS	WOOD	2.34	40	2.10	1.65	3.28	1.91	4	244.99
295	MARACAS	*RATTLES*	2.55	13	2.48	1.73	2.91	1.95	7	10.70
296	MICROSCOPE	*TELESCOPE*	1.49	30	3.56	1.92	4.22	1.40	9	10.70
297	NET	NET	0.24	83	2.29	1.74	3.00	1.72	3	30.90
298	PADDLE	*MIRROR*	2.95	23	2.23	1.70	2.08	1.72	6	34.49
299	PARACHUTE	PARACHUTE	0.90	67	3.00	2.00	3.72	1.81	9	8.30
300	PARROT	PARROT	1.52	50	3.00	1.85	4.17	1.56	6	30.90
301	PICTURE	PICTURE	0.35	93	2.60	1.92	2.93	1.93	7	887.20
302	PINBALL MACHINE	*BED*	2.23	20	3.24	1.71	3.24	1.86	3	254.50
303	PLATYPUS	*DUCK*	2.12	13	2.82	1.89	3.73	1.35	4	142.71
304	RAKE	RAKE	0.41	73	1.59	1.34	2.78	1.87	4	15.50
305	ROCKET	*ROCKET SHIP*	1.58	57	2.50	1.77	3.29	1.94	10	--
306	ROPE	ROPE	0.21	97	2.27	1.70	2.47	1.81	4	111.80
307	SADDLE	SADDLE	0.00	23	2.65	1.77	4.41	1.18	6	26.20
308	SAFE	*REFRIGERATOR*	2.58	30	3.23	1.82	3.62	1.77	12	28.54
309	SCALE	SCALE	2.29	30	3.00	1.89	3.32	1.67	5	67.80
310	SCOOP	SHOVEL, *SPOON*	2.43	30	2.85	1.87	2.38	1.77	5	20.22
311	SHOWERHEAD	SHOWER	1.16	73	3.00	1.97	3.60	1.83	6	5.95
312	SYRINGE	*SHOT*	1.22	67	1.93	1.59	3.71	1.74	4	53.52
313	TAMBOURINE	TAMBOURINE	1.44	47	2.38	1.78	2.79	1.80	10	4.80
314	TELESCOPE	TELESCOPE	1.44	40	3.86	1.74	3.48	1.78	9	10.70
315	THERMOS	THERMOS	2.44	17	2.71	1.90	3.00	1.57	7	1.20
316	TIRE	*WHEEL*	0.94	60	2.50	1.77	3.29	1.78	5	80.87
317	TRACTOR	TRACTOR	2.20	30	2.27	1.70	4.36	1.43	7	16.60
318	TRAM CAR	CABLE CAR	3.00	13	2.70	1.81	3.44	1.78	8	--
319	WEATHER VANE	*ARROW*	1.37	10	2.17	1.80	3.64	1.78	5	48.76
320	YOYO	YOYO	0.21	97	2.87	1.89	3.00	1.82	4	--
321	ZIPPER	ZIPPER	0.00	70	2.73	1.88	3.91	1.60	6	4.80
322	ANTEATER	ANTEATER	2.41	10	2.40	1.65	4.00	1.70	8	27.35
323	ANVIL		2.00	0	3.00	1.63	3.50	1.91	5	0.00
324	ARCH	TUNNEL	2.24	43	2.54	1.90	2.23	1.80	6	32.11
325	ARMADILLO	RAT	1.49	17	1.00	0.00	4.09	1.64	3	59.46
326	AVOCADO	EGG	2.89	17	2.80	1.94	2.30	1.63	3	135.58
327	BASEBALL GLOVE	BASEBALL GLOVE	2.19	37	2.31	1.79	3.62	1.78	13	--
328	BAT	BAT	0.22	93	2.10	1.65	3.90	1.65	3	80.87
329	BIRD CAGE	CAGE	1.69	50	2.69	1.93	3.92	1.52	4	13.08
330	BLOWFISH	FISH	2.35	20	2.33	1.95	3.13	1.92	4	--

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
331	BRAIN	BRAIN	1.65	67	3.28	1.83	4.10	1.57	5	20.22
332	BUFFALO	BULL	2.78	13	2.29	1.86	4.00	1.52	4	15.46
333	CACTUS	CACTUS	1.17	60	2.28	1.72	3.00	1.63	6	35.68
334	CALIPERS	BELT	1.91	17	2.38	1.71	1.92	1.75	4	26.16
335	CAN	CAN	0.92	77	2.00	1.49	2.64	1.73	3	- -
336	CHEESE	CHEESE	0.21	97	2.60	1.92	2.60	1.69	6	65.41
337	COCKROACH	BUG	2.08	43	2.04	1.74	3.80	1.73	3	17.84
338	COMPASS	CLOCK	1.02	73	2.29	1.82	3.29	1.86	5	95.14
339	CRAB	CRAB	0.65	67	2.44	1.87	4.44	1.23	4	17.84
340	CYMBALS	WHEEL	3.10	13	2.55	1.74	2.55	1.74	5	4.76
341	DART	NEEDLE	2.87	10	2.73	1.83	2.73	1.83	6	42.81
342	DINOSAUR	DINOSAUR	0.00	93	2.79	1.83	3.64	1.73	8	98.71
343	DOGHOUSE	DOGHOUSE	0.63	90	2.13	1.72	2.33	1.60	8	1.19
344	DRAGONFLY	BUTTERFLY	2.32	43	2.14	1.76	3.50	1.93	9	30.92
345	EASEL	EASEL	2.28	47	2.52	1.66	3.97	1.48	5	1.19
346	EEL	FISH	2.56	20	2.47	1.74	2.05	1.54	4	486.41
347	FISHBOWL	FISH TANK	2.07	43	2.31	1.79	3.28	1.91	8	- -
348	FISHTAIL	FIN	2.55	27	2.29	1.82	3.07	1.84	3	5.95
349	FLAMINGO	FLAMINGO	2.02	40	2.20	1.63	3.56	1.58	8	2.38
350	FUNNEL	FUNNEL	2.25	7	2.78	1.80	1.44	1.10	6	19.03
351	HAMBURGER	HAMBURGER	1.93	40	3.07	1.92	3.14	1.88	9	13.08
352	HAMMOCK	HAMMOCK	1.56	23	2.58	1.71	3.32	1.80	7	3.57
353	HARMONICA	HARMONICA	1.95	27	3.24	1.85	2.84	1.62	9	3.57
354	HORSESHOE	HORSESHOE	1.19	43	2.22	1.68	2.22	1.68	9	11.89
355	HYENA	WOLF	2.46	27	2.30	1.87	3.40	1.79	4	46.38
356	IGLOO	IGLOO	1.10	47	1.80	1.51	2.40	1.85	5	1.19
357	JAR	JAR	1.36	67	2.10	1.65	2.52	1.82	3	88.01
358	JELLYFISH	JELLYFISH	1.77	30	2.88	2.00	3.50	1.71	9	4.76
359	KOALA	KOALA	2.48	23	2.77	1.73	4.46	1.33	5	0.00
360	LADLE	SPOON	1.36	67	2.52	1.82	2.24	1.72	5	20.22
361	LADYBUG	LADYBUG	0.62	77	2.50	1.77	2.71	1.86	7	8.32
362	LAMB	LAMB	1.67	43	2.36	1.81	3.86	1.67	4	16.65
363	LIPSTICK	LIPSTICK	0.00	97	2.17	1.81	2.79	1.80	8	2.38
364	LIZARD	LIZARD	0.23	87	2.63	1.92	3.44	1.78	6	33.30
365	LLAMA	CAMEL	1.78	23	2.00	1.81	3.33	2.06	5	22.60
366	LUNGS	LUNGS	2.72	37	3.08	1.78	3.56	1.87	5	30.92
367	MOOSE	MOOSE	1.80	33	2.53	1.81	3.71	1.72	5	1.19
368	OCTOPUS	OCTOPUS	0.00	87	2.26	1.77	3.96	1.60	7	9.51
369	PALM TREE	PALM TREE	1.38	43	2.70	1.81	3.44	1.78	8	17.84
370	PANDA	PANDA BEAR	2.10	33	2.79	1.83	3.43	1.91	9	10.70
371	PEAS	PEAS	3.27	17	2.83	1.90	2.13	1.46	4	15.46
372	PELICAN	BIRD	1.95	17	1.94	1.43	3.59	1.54	4	337.75
373	PRETZEL	PRETZEL	0.21	97	3.60	1.83	3.00	1.82	7	0.00
374	PROPELLER	PROPELLER	2.86	10	2.60	1.88	2.07	1.83	9	5.95
375	PYRAMID	PYRAMID	2.35	33	2.76	1.94	2.04	1.74	7	0.00
376	RAT	RAT	0.94	60	2.31	1.63	3.90	1.65	3	59.46
377	RAY	BAT	2.42	23	2.30	1.75	2.80	1.82	3	80.87
378	ROSEBUD	FLOWER	1.52	50	2.79	1.80	2.86	1.92	6	76.11
379	SAXOPHONE	SAXOPHONE	1.84	37	1.86	1.58	4.36	1.22	9	0.00

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	AH-3
					Mean	SD	Mean	SD		
380	SCORPION	**LOBSTER**	2.04	37	1.96	1.70	4.48	1.31	7	5.95
381	SHARK	SHARK	0.92	80	2.27	1.78	4.00	1.55	5	5.95
382	SKELETON	SKELETON	0.58	83	2.86	1.92	4.72	1.03	8	21.41
383	SKULL	**SKELETON**	2.80	30	1.97	1.66	3.48	1.82	8	21.41
384	SPATULA	**PAN, SHOVEL**	2.57	13	2.42	1.72	2.58	1.86	3	78.49
385	SPIDER WEB	SPIDER WEB	0.57	87	2.40	1.83	3.67	1.69	9	16.65
386	SQUASH	SQUASH	1.92	7	2.14	1.95	1.57	1.51	6	14.27
387	STARFISH	STARFISH	1.07	73	2.45	1.84	2.66	1.86	8	20.22
388	STETHOSCOPE	STETHOSCOPE	1.37	20	3.23	1.90	3.15	1.87	11	2.38
389	SWORDFISH	SWORDFISH	2.27	40	2.41	1.82	2.93	1.71	9	5.95
390	THERMOMETER	THERMOMETER	1.78	40	2.46	1.92	3.08	1.74	11	52.33
391	TOTEM POLE	TOTEM POLE	2.92	7	2.54	1.85	2.85	1.91	9	0.00
392	TOUCAN	**BIRD**	1.51	40	2.41	1.82	4.19	1.39	4	337.75
393	TURKEY	TURKEY	1.16	70	2.59	1.80	4.17	1.47	6	80.87
394	VULTURE	**BIRD**	1.78	30	2.39	1.95	4.13	1.46	4	337.75
395	WALRUS	WALRUS	1.88	23	2.52	1.89	3.57	1.80	6	9.51
396	WASHING MACHINE	WASHING MACHINE	2.16	47	2.85	1.99	3.37	1.84	14	36.87
397	WHALE	WHALE	1.38	60	2.48	1.89	3.74	1.68	5	72.55
398	WHIP	WHIP	2.19	20	2.52	1.78	2.43	1.91	4	20.22
399	WOLF	WOLF	1.69	43	3.00	2.00	3.35	1.87	4	46.38
400	WORM	WORM	1.28	50	2.62	1.96	2.14	1.62	4	35.68

Note: Modal name - the name most often given by the subjects; H statistic and percentage agreement (%) are two measures of name agreement; Length - the number of letters in the modal name; (AH-3) - frequency count of the modal name, found in the American Heritage for third graders, expressed as occurances per million words. The (--) indicates that data are not available. Those modal names that differed from the modal names given by adults are printed in bold type, those that differed from the modal names given by the 8-10 year old children are printed in italics, and those modal names that differed from both groups are printed in bold type and italics. When no modal name is given, children did not elicit a modal name.

Table-2: *Adult Picture Norms for Picture Set-3*

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	K-F
					Mean	SD	Mean	SD		
322	ANTEATER	ANTEATER	0.86	67	2.57	1.30	3.72	0.88	8	1
323	ANVIL	ANVIL	0.30	60	2.83	1.37	2.67	0.92	5	1
324	ARCH	ARCH	2.35	47	3.43	1.28	2.30	1.09	4	16
325	ARMADILLO	ARMADILLO	1.11	67	3.00	1.41	3.86	0.88	9	2
326	AVOCADO	AVOCADO	2.04	57	3.73	1.28	2.60	1.16	7	16
327	BASEBALL GLOVE	BASEBALL GLOVE	2.07	50	4.30	0.95	3.47	0.97	13	- -
328	BAT	BAT	0.00	100	3.93	1.14	3.23	0.82	3	18
329	BIRD CAGE	BIRD CAGE	1.12	73	4.13	3.77	3.77	1.01	8	- -
330	BLOWFISH	BLOWFISH	1.80	40	2.79	1.52	3.00	1.04	8	1
331	BRAIN	BRAIN	1.28	77	4.37	0.93	4.00	0.79	5	64
332	BUFFALO	BUFFALO	1.25	60	3.20	1.40	3.60	0.77	7	10
333	CACTUS	CACTUS	0.22	93	4.00	1.17	2.37	0.89	6	- -
334	CALIPERS	CALIPERS	1.61	23	1.90	1.18	2.14	0.99	8	- -
335	CAN	CAN	1.47	63	4.47	0.90	2.59	0.78	3	- -
336	CHEESE	CHEESE	1.17	53	4.53	0.68	2.17	0.79	6	9
337	COCKROACH	COCKROACH	2.26	37	3.67	1.35	3.53	0.86	9	2
338	COMPASS	COMPASS	0.69	83	3.97	0.89	3.67	0.96	7	12
339	CRAB	CRAB	0.63	90	3.90	1.18	3.93	0.94	4	2
340	CYMBALS	CYMBALS	2.22	40	2.97	1.59	3.30	1.15	7	- -
341	DART	DART	0.00	100	4.17	1.12	3.30	1.21	4	7
342	DINOSAUR	DINOSAUR	0.97	80	3.83	1.21	3.30	0.95	8	2
343	DOGHOUSE	DOGHOUSE	0.42	93	4.13	1.11	2.67	0.96	8	1
344	DRAGONFLY	DRAGONFLY	1.78	47	3.40	1.19	4.03	0.85	9	- -
345	EASEL	EASEL	0.47	80	3.72	1.22	3.23	1.01	5	5
346	EEL	EEL	0.24	83	3.07	1.31	2.60	0.81	3	2
347	FISHBOWL	FISHBOWL	1.37	67	4.17	0.95	3.43	1.10	8	- -
348	FISHTAIL	FISHTAIL	1.46	57	3.80	1.06	3.30	1.02	8	- -
349	FLAMINGO	FLAMINGO	1.37	63	3.63	1.13	3.23	0.90	8	- -
350	FUNNEL	FUNNEL	0.44	87	4.17	1.45	1.45	0.78	6	2
351	HAMBURGER	HAMBURGER	1.11	77	4.50	0.94	3.03	0.93	9	10
352	HAMMOCK	HAMMOCK	0.00	100	3.87	1.25	3.03	0.98	7	5
353	HARMONICA	HARMONICA	0.24	83	3.69	1.31	4.25	0.89	9	- -
354	HORSESHOE	HORSESHOE	0.35	93	3.97	1.30	2.10	0.86	11	- -
355	HYENA	HYENA	1.98	47	2.76	1.35	3.86	0.79	5	1
356	IGLOO	IGLOO	0.00	100	3.83	1.32	2.70	0.88	5	- -
357	JAR	JAR	1.44	70	4.53	0.73	2.50	1.17	3	19
358	JELLYFISH	JELLYFISH	0.55	63	3.10	1.42	3.20	0.81	9	- -
359	KOALA	KOALA BEARS	1.89	53	3.83	1.15	3.67	1.06	5	- -
360	LADLE	LADLE	0.77	83	3.87	1.36	2.20	0.89	5	1
361	LADYBUG	LADYBUG	0.67	87	4.00	0.98	3.31	0.76	7	1
362	LAMB	LAMB	1.07	73	3.67	1.12	3.13	0.90	4	1
363	LIPSTICK	LIPSTICK	0.00	100	4.23	1.14	2.97	1.07	8	3
364	LIZARD	LIZARD	1.18	70	3.50	1.17	2.90	0.82	6	2
365	LLAMA	LLAMA	0.70	77	3.00	1.31	3.10	0.96	5	- -
366	LUNGS	LUNGS	1.06	80	3.77	1.14	3.50	0.94	5	20
367	MOOSE	MOOSE	0.93	63	3.28	1.25	3.34	0.86	5	- -

Item	Intended Name	Modal Name	H	%	Familiarity		Visual Complexity		Length	K-F
					Mean	SD	Mean	SD		
368	OCTOPUS	OCTOPUS	0.42	93	3.50	1.22	3.60	0.89	7	1
369	PALM TREE	PALM TREE	0.42	93	3.90	1.06	3.31	1.07	8	--
370	PANDA	PANDA	1.54	47	4.03	1.13	3.17	1.05	5	--
371	PEAS	**PEA POD**	1.47	63	3.90	1.27	3.07	1.01	4	24
372	PELICAN	PELICAN	0.59	83	3.33	1.21	3.83	0.83	7	--
373	PRETZEL	PRETZEL	0.21	97	4.23	1.14	2.53	1.07	7	--
374	PROPELLER	PROPELLER	0.83	77	3.40	1.28	2.70	1.15	9	--
375	PYRAMID	PYRAMID	0.00	100	3.80	1.30	2.21	0.90	7	2
376	RAT	RAT	0.65	83	4.17	0.99	3.50	1.01	3	10
377	RAY	**MANTA RAY**	2.48	27	2.63	1.27	3.20	0.89	8	10
378	ROSEBUD	**ROSE**	1.73	48	4.33	0.99	3.37	1.03	4	--
379	SAXOPHONE	SAXOPHONE	0.77	87	3.93	1.23	4.31	0.76	9	4
380	SCORPION	SCORPION	1.29	57	3.30	1.42	3.97	0.76	8	--
381	SHARK	SHARK	0.42	93	4.10	1.03	2.67	1.06	5	4
382	SKELETON	SKELETON	0.78	77	4.43	1.07	4.48	0.91	8	3
383	SKULL	SKULL	0.99	77	4.30	1.02	3.73	0.91	5	5
384	SPATULA	SPATULA	0.24	83	4.55	0.69	2.68	1.16	7	--
385	SPIDER WEB	SPIDER WEB	1.37	57	4.20	1.03	3.10	1.06	9	--
386	SQUASH	SQUASH	1.84	37	3.21	1.62	1.86	0.80	6	2
387	STARFISH	STARFISH	0.00	100	3.63	1.13	3.41	1.12	8	--
388	STETHOSCOPE	STETHOSCOPE	0.00	100	4.23	0.86	2.97	0.93	11	2
389	SWORDFISH	SWORDFISH	0.90	77	2.93	1.31	3.40	0.97	9	--
390	THERMOMETER	THERMOMETER	0.21	97	4.50	0.73	2.80	1.10	11	16
391	TOTEM POLE	TOTEM POLE	0.43	90	3.63	1.30	4.27	0.87	9	--
392	TOUCAN	TOUCAN	1.84	50	3.13	1.25	3.80	0.85	6	--
393	TURKEY	TURKEY	0.21	97	4.20	1.06	4.07	1.01	6	4
394	VULTURE	VULTURE	1.15	73	3.20	1.24	3.83	0.75	7	4
395	WALRUS	WALRUS	0.22	93	3.43	1.30	3.30	1.09	6	1
396	WASHING MACHINE	WASHING MACHINE	0.97	83	4.60	0.62	4.17	0.83	14	--
397	WHALE	WHALE	1.27	73	3.57	1.30	3.17	0.91	5	1
398	WHIP	WHIP	0.46	83	3.00	1.46	2.67	1.32	4	16
399	WOLF	WOLF	0.67	87	3.77	1.19	3.07	1.05	4	9
400	WORM	WORM	1.66	43	3.83	1.18	2.76	0.87	4	8

Note: Modal name - the name most often given by the subjects; H statistic and percentage agreement (%) are two measures of name agreement; Length - the number of letters in the modal name; (K-F) - frequency count of the modal name, found in Kucera-Francis, expressed as occurances per million words. The (--) indicates that data are not available. Those modal names that differed from the intended names are printed in bold type.

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Appendix C

The following tables present subject responses other than the intended names for picture sets 1, 2, and 3 listed accordings to their presentation in Appendices A and B. Tables 1 presents alternate responses of 5-7 year old subjects, and table 2 presents alternate responses of adult subjects for Set 3.

Table 1: *Nondominant Names Given by Young Children*

	Intended Name	DKO	DKN	Nondominant Names
1.	ACCORDION	3	17	saxophone (1) music* (1) piano (1) instrument (1)
2.	AIRPLANE	0	0	plane (5) jet (1)
3.	ALLIGATOR	0	0	crocodile (9) lizard (2) dragon (1)
4.	ANCHOR	9	2	hook (6)
5.	ANT	4	1	bug (6) spider (4)
6.	APPLE	0	0	
7.	**ARM**	0	0	hand (15) finger (2) hand and wrist (1)
8.	ARROW	0	0	
9.	ARTICHOKE	14	4	balloon† (2) bananas† (1) cabbages (1) fruit† (1) lettuce (1) palm tree† (1) parachute† (1) tree† (1) vegetable (1)
10.	**ASHTRAY**	24	0	hole† (3) magnify glass† (1) stethoscope† (1) to make shapes† (1)
11.	ASPARAGUS	11	3	stick† (3) branch† (3) candle† (2) chicken† (1) leaf† (1)
12.	AXE	3	2	hammer (4) chopper (1) tomahawk (1)
13.	**BABY CARRIAGE**	0	1	carriage (20) stroller (4) baby cart (1)
14.	BALL	0	0	
15.	BALLOON	0	0	
16.	BANANA	0	0	
17.	BARN	2	0	farm (8) house (4) farm house (2) barn house (1) cow house (1) toy† (1)
18.	BARREL	13	0	basket (2) garbage can (2) box (1)
19.	**BASEBALL BAT**	0	2	bat (22)
20.	BASKET	1	0	
21.	BEAR	2	0	polar bear (4)
22.	BED	0	0	

	Intended Name	DKO	DKN	Nondominant Names
23.	BEE	0	0	bumble bee (4) bug (4) spider (2)
24.	**BEETLE**	7	0	bug (7) spider (5) ant (3) cockroach (2) cricket (1) fly (1) grasshopper (1) insect (1)
25.	BELL	0	0	
26.	BELT	1	0	watch† (3) collar (1)
27.	BICYCLE	0	0	bike (7)
28.	BIRD	0	0	ducky (1) little baby chick (1) pigeon (1)
29.	**BLOUSE**	0	0	shirt (13) jacket (11) coat (5) dress (1)
30.	BOOK	0	0	
31.	BOOT	0	0	shoe (1)
32.	BOTTLE	0	0	cup (1) glass of wine (1) wine* (1) wine bottle (1)
33.	BOW	0	0	bow tie (2) ribbon (1) tie (1)
34.	BOWL	0	0	cup (1)
35.	BOX	0	0	little box (1)
36.	BREAD	0	0	loaf of bread (1) piece of bread (1) slice of bread (1)
37.	BROOM	0	0	
38.	BRUSH	0	0	hairbrush (1)
39.	BUS	0	0	school bus (2)
40.	BUTTERFLY	0	0	
41.	BUTTON	0	0	door knob‡ (1) wheel‡ (1)
42.	CAKE	0	0	piece of cake (1)
43.	CAMEL	1	2	
44.	CANDLE	0	0	candle light (1)
45.	CANNON	10	4	gun (2) wheel (2)
46.	**CAP**	1	0	hat (18) baseball cap (1) baseball hat (1)
47.	CAR	0	0	
48.	CARROT	0	1	
49.	CAT	0	0	
50.	CATERPILLAR	9	1	worm (3) ant (1) bug (1) teeth‡ (1)
51.	CELERY	6	3	lettuce (6) corn (2) kind of fruit‡ (1) parsley (1) radish (1) salad (1)

	Intended Name	DKO	DKN	Nondominant Names
52.	CHAIN	2	0	
53.	CHAIR	0	0	
54.	**CHERRY**	3	1	apple (11) grape (2) berry (1) radish† (1) yoyo† (1)
55.	CHICKEN	1	1	hen (5) rooster (5) bird (1) goose (1) turkey (1)
56.	**CHISEL**	16	2	screwdriver (8) tool (2) peeler (1) to fix stuff* (1)
57.	**CHURCH**	1	0	house (14) castle (2) village† (1)
58.	CIGAR	7	1	cigarette (6) pencil† (5) carrot† (1) salami† (1) smoke (1)
59.	CIGARETTE	7	1	cigar (2) rand† (1) smoke (1)
60.	CLOCK	0	0	
61.	**CLOTHESPIN**	1	5	clip (14) pin (2) clipper† (1)
62.	CLOUD	7	0	bush† (2) cauliflower† (1) clown† (1) dough† (1) grass† (1) ice cream† (1) mash potato† (1) paddle† (1) piece of cake† (1) snow† (1) tree† (1)
63.	CLOWN	0	0	head (1)
64.	COAT	0	0	jacket (10) shirt (4) suit (1)
65.	COMB	0	0	brush (3)
66.	CORN	0	0	
67.	COUCH	1	0	sofa (3)
68.	COW	3	0	moose (1)
69.	CROWN	0	1	hat (1) king's hat (1)
70.	CUP	0	0	tea cup (6)
71.	DEER	4	3	moose (1) reindeer (1)
72.	DESK	1	0	drawer (6) table (2) work table (1)
73.	DOG	0	0	
74.	DOLL	0	0	girl† (9) little girl† (4) baby† (1) children or person† (1)
75.	DONKEY	0	0	horse (7) baby horse (1) pony (1)
76.	DOOR	0	0	
77.	DOORKNOB	9	1	put a cake on it† (1) seat† (1) something to exercise† (1) table† (1) thread† (1) toy† (1) weight† (1) weight thing† (1) wheel† (1)
78.	DRESS	1	0	skirt (2) clothing (1) shirt (1)
79.	**DRESSER**	0	1	drawer (8) drawers (7) shelf (3) bureau (2) chest drawer* (1) desk (1) furniture (1)
80.	DRUM	1	1	pail† (2)

	Intended Name	DKO	DKN	Nondominant Names
81.	DUCK	0	0	bird (1) goose (1)
82.	**EAGLE**	4	0	bird (9) parrot (9) vulture (1)
83.	EAR	0	0	
84.	ELEPHANT	0	0	
85.	ENVELOPE	0	3	letter (7) mail (1) postcard (1)
86.	EYE	0	0	eyeball (1) eyelash (1)
87.	FENCE	0	0	gate (9)
88.	FINGER	0	0	hand (2) pointer (1)
89.	FISH	0	0	
90.	FLAG	0	0	
91.	FLOWER	0	0	
92.	FLUTE	8	2	stick† (5) chop stick† (1) harmonica (1)
93.	FLY	1	0	bug (7) bee (3) ant (1) spider (1)
94.	FOOT	0	0	leg (1) toe (1)
95.	FOOTBALL	2	0	baseball (2) ball (1) football ball (1)
96.	**FOOTBALL HELMET**	3	4	helmet (14) football hat (2) baseball hat (1) baseball helmet (1)
97.	FORK	0	0	
98.	FOX	2	0	wolf (6)
99.	**FRENCH HORN**	3	12	trumpet (4) trombone (3) horn (2) saxophone (2) drum (1) instrument (1) microphone† (1)
100.	FROG	0	0	toad (1)
101.	**FRYING PAN**	0	0	pan (21) pot (6) cooking bowl (1)
102.	GARBAGE CAN	0	0	garbage (6) trash can (6) garbage pail (1) trash (1)
103.	GIRAFFE	2	0	zebra (2) camel (1)
104.	**GLASS**	0	0	cup (19)
105.	GLASSES	0	0	eye glasses (2)
106.	GLOVE	0	0	hand† (7) mitten (1)
107.	GOAT	2	2	deer (2) sheep (2) animal (1) donkey (1) moose (1) ox (1)
108.	GORILLA	0	0	monkey (7) baboon (1) Kingkong (1)
109.	GRAPES	0	0	

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	Intended Name	DKO	DKN	Nondominant Names
110.	GRASSHOPPER	3	1	bug (7) beetle (2) cricket (2) spider (2) ant (1) bee (1) cockroach (1) insect (1) mosquito (1)
111.	GUITAR	0	4	violin (2)
112.	GUN	0	0	
113.	HAIR	12	0	hat† (2) clam† (1) head (1) helmet† (1) mushroom† (1) person's hair (1) shell† (1)
114.	HAMMER	2	0	tool (1)
115.	HAND	0	0	whole hand (1)
116.	HANGER	1	0	coat hanger (1) cone† (1)
117.	HARP	6	12	instrument (1) music box (1) music thing* (1)
118.	HAT	0	0	cap (1)
119.	HEART	0	0	
120.	HELICOPTER	1	0	airplane (1)
121.	HORSE	0	0	pony (1)
122.	HOUSE	0	0	country house (1)
123.	IRON	3	3	ironer* (2) ironing* (1) ironing machine (1) ironing thing* (1) sink† (1) vacuum cleaner (1)
124.	IRONING BOARD	7	2	table† (7) iron board (2) iron* (1) iron stool* (1) iron table (1) ironing table* (1) ironing thing* (1)
125.	JACKET	1	1	shirt (11) coat (3) rain coat (1) t-shirt (1)
126.	KANGAROO	1	1	animal (1)
127.	KETTLE	2	3	teapot (10) tea kettle (4) pot (3) pan (1) stove† (1) tea* (1) tea roller* (1)
128.	KEY	0	0	
129.	KITE	1	0	
130.	KNIFE	1	0	bone† (1)
131.	LADDER	0	0	
132.	LAMP	0	1	light (5) light bulb (1)
133.	LEAF	0	0	feather† (1)
134.	LEG	0	0	foot (12) feet and leg (1) knee (1)
135.	LEMON	0	2	etrog (2) fruit (1) lime (1) melon (1) orange (1)
136.	LEOPARD	4	0	tiger (9) cheetah (4) jaguar (3) laughing hyena (1) lion (1)

	Intended Name	DKO	DKN	Nondominant Names
137.	**LETTUCE**	9	1	cabbage (6) flower (3) salad (3) cauliflower (1) nut† (1) plater† (1) radish (1) sea shell† (1)
138.	LIGHT BULB	1	0	light (5) bulb (2) lamp (1)
139.	LIGHT SWITCH	2	3	light (9) switch (4) switch and light (1) switch light* (1)
140.	LION	0	0	tiger (3)
141.	LIPS	0	0	mouth (7)
142.	LOBSTER	4	1	crab (8) mask† (1)
143.	LOCK	2	1	locker* (3) chain (1) hanger† (1) key locker* (1) locker thing* (1)
144.	MITTEN	0	1	glove (6)
145.	MONKEY	0	0	chimpanzee (1)
146.	MOON	0	0	
147.	MOTORCYCLE	1	0	bicycle (5)
148.	MOUNTAIN	1	0	hill (1) rock (1)
149.	MOUSE	1	0	rat (5) mice (1)
150.	MUSHROOM	2	2	
151.	NAIL	6	0	needle (3) screw (2) pin (1) vacuum cleaner† (1)
152.	**NAIL FILE**	0	0	knife (26) butcher's knife† (1) nail sharpener (1) pen† (1)
153.	NECKLACE	0	0	
154.	NEEDLE	0	0	nail (2) pin (2) brush† (1) fire match† (1) using it in orchestra† (1)
155.	NOSE	3	0	
156.	**NUT**	13	5	screw (5) nail (2) block† (1) bolt (1) screw driver (1) tool (1)
157.	ONION	5	0	pomegranate† (2) balloon† (1) etrog† (1) garlic (1) radish (1)
158.	ORANGE	1	0	peach (3) ball† (2) grapefruit (1)
159.	OSTRICH	8	3	flamingo (2) peacock (2) animal† (1) bird (1) goose (1) swan (1)
160.	OWL	1	0	bird (1)
161.	PAINTBRUSH	0	0	brush (2) pen (1)
162.	PANTS	0	0	legging (1)
163.	**PEACH**	4	0	orange (8) apple (3) plum (3) yoyo† (3) makeup bottle† (1) pear (1) sandwich† (1)
134.	PEACOCK	5	2	turkey (8) bird (1) chicken (1) ostrich (1)
135.	PEANUT	1	0	nut (7)

	Intended Name	DKO	DKN	Nondominant Names
166.	PEAR	0	0	plum (1)
167.	PEN	0	0	pencil (6)
168.	PENCIL	0	0	
169.	PENGUIN	2	0	
170.	PEPPER	3	2	pumpkin (3) apple (1) cucumber (1) fruit (1) red hot* (1)
171.	PIANO	1	0	
172.	PIG	0	0	
173.	PINEAPPLE	5	7	coconut (1) fruit (1)
174.	PIPE	1	6	smoking pipe (1) smoking thing* (1)
175.	PITCHER	6	8	kettle (2) bottle (1) jug (1) tea* (1) tea pot (1) vase† (1)
176.	**PLIERS**	5	14	tool (7) wrench (2)
177.	PLUG	0	3	wire (4) electricity (1) light thing* (1)
178.	POCKETBOOK	0	0	purse (10) bag (4)
179.	**POT**	2	1	pan (13) bowl (1) tea pot (1)
180.	POTATO	2	0	nut (4) peanut (2) cookie† (1) rock† (1) tomato (1)
181.	PUMPKIN	0	0	
182.	RABBIT	0	0	bunny rabbit (6) bunny (3)
183.	RACCOON	7	1	fox (6) skunk (2)
184.	RECORD PLAYER	3	2	record (2) musical box (1) player machine* (1) record box* (1) tape recorder(1)
185.	REFRIGERATOR	1	0	fridge (1)
186.	RHINOCEROS	4	2	rhino (4) hippopotamus (3) dinosaur (2) animal (1) hippo (1)
187.	RING	2	0	
188.	ROCKING CHAIR	0	0	chair (3)
189.	ROLLER SKATE	0	1	skate (7) bicycle (1) chair with wheels† (1) roller blades (1) roller skating* (1) skateboard (1) skip board* (1)
190.	ROLLING PIN	3	4	roller (3) roller pin* (2) roll* (1) roller penner* (1) roller thing* (1) roller to make dough (1) rolling baker* (1)
191.	ROOSTER	1	1	chicken (11) hen (3) turkey (2)
192.	RULER	2	1	measuring* (2) measuring tape (1) measuring thing* (1)
193.	**SAILBOAT**	0	0	boat (21) ship (2)
194.	**SALT SHAKER**	2	0	salt (19) salt and pepper (1) salt container (1)

	Intended Name	DKO	DKN	Nondominant Names
195.	SANDWICH	0	0	tunafish sandwich (1)
196.	SAW	3	5	knife (1) sword (1)
197.	SCISSORS	0	0	
198.	**SCREW**	5	0	nail (16) needle (1) screw driver (1) tool (1)
199.	SCREWDRIVER	5	1	tool (3) tool screw driver (1) wrench (1)
200.	SEAHORSE	3	3	horse fish* (4) fish (2) horse† (1) sea fish (1) sea thing† (1)
201.	SEAL	1	2	walrus (2) dolphin (1)
202.	SHEEP	5	1	lamb (8) cow (1) fat sheep (1) ham* (1)
203.	SHIRT	0	0	jacket (9) coat (2) t-shirt (1)
204.	SHOE	0	0	
205.	SKIRT	6	1	dress (2) apron (1) bottle† (1)
206.	SKUNK	2	1	raccoon (4) squirrel (1)
207.	SLED	2	3	ski (1)
208.	SNAIL	5	0	worm (1)
209	SNAKE	0	0	wild snake (1)
210.	SNOWMAN	0	0	
211.	SOCK	0	0	
212.	SPIDER	5	0	bug (3) daddy long legs (1) tarantula (1)
213.	SPINNING WHEEL	16	3	sewing machine (3) wheel (2) machine (1) spindle (1)
214.	**SPOOL THREAD**	4	5	thread (7) yarn (4) string (3) sewer* (2) sewing* (2) sew* (1) spool (1)
215.	SPOON	0	0	
216.	SQUIRREL	1	0	chipmunk (4)
217.	STAR	0	0	
218.	STOOL	0	0	chair (13) small table (1) step† (1) stool chair (1)
219.	STOVE	0	0	oven (13) microwave (1) washing machine (1)
220.	STRAWBERRY	1	0	berry (1) tomato (1)
221.	SUITCASE	0	0	briefcase (2) suit† (1)
222.	SUN	0	0	sunshine (2)
223.	SWAN	2	1	duck (6) goose (4)
224.	**SWEATER**	0	0	shirt (15) sweat shirt (2) coat (1) jacket (1) t-shirt (1)

	Intended Name	DKO	DKN	Nondominant Names
225.	SWING	2	0	mirror† (2)
226.	TABLE	0	0	desk (1)
227.	TELEPHONE	0	0	phone (4)
228.	**TELEVISION**	0	0	T.V. (23)
229.	TENNIS RACKET	0	1	tennis thing* (3) racket (2) tennis* (2)
230.	**THIMBLE**	5	2	cup† (10) pail† (3) bottle cap† (1) for garbage† (1) garbage can† (1) little cup† (1)
231.	THUMB	0	0	finger (14)
232.	TIE	0	0	necktie (7) bow tie (2)
233.	TIGER	2	0	lion (4) leopard (1)
234.	TOASTER	3	1	oven (1) toaster oven (1)
235.	TOE	0	0	foot (10) toes (5) toenail (1)
236.	TOMATO	1	0	apple† (1) pomegranate† (1) pumpkin (1)
237.	TOOTHBRUSH	0	0	
238.	**TOP**	2	2	dreidle (14)
239.	TRAFFIC LIGHT	2	4	street light (8) light (3) light changing* (1) light on street (1) light switch† (1) light thing* (1)
240.	TRAIN	0	0	bus (1) fire engine (1)
241.	TREE	0	0	
242.	TRUCK	0	0	tractor (1) tractor trailer (1)
243.	TRUMPET	1	8	horn (2) saxophone (2) trombone (2) flute (1) instrument (1) music thing* (1)
244.	TURTLE	0	0	
245.	UMBRELLA	0	0	
246.	VASE	2	2	bowl (2) flower pot (1) keion† (1) pottery (1) souvenir†(1) vane† (1)
247.	VEST	3	2	shirt (8) jacket (2) sweater (1)
248.	**VIOLIN**	0	5	guitar (15) banjo (1) cello (1)
249.	WAGON	3	4	
250.	WATCH	0	0	belt (1)
251.	WATERING CAN	1	14	pail (1) sprinkler (1) sprinkler can* (1) water (1) water plant* (1) water plant flow* (1) water pot* (2) water thing* (1)
252.	WATERMELON	0	2	melon (2) melon bowl* (1) orange (1) orange slice (1)
253.	WELL	2	4	

	Intended Name	DKO	DKN	Nondominant Names
254.	WHEEL	1	0	tire (1)
255.	WHISTLE	1	0	
256.	WINDMILL	14	0	spinning wheel† (2) church† (1) swinger† (1)
257.	WINDOW	0	0	door (2)
258.	**WINEGLASS**	0	0	cup (23) glass (5)
259.	WRENCH	3	3	tool (8) screwdriver (4) hammer (1)
260.	ZEBRA	1	0	
261.	ACORN	5	3	nut (4) flower† (1) peanut (1) walnut (1)
262.	**BASIN**	4	5	box† (5) bowl (3) bathtub (2) bucket (2) baby pot* (1) ban† (1) basket† (1) bath† (1) bin† (1) container (1) tub (2)
263.	BENCH	0	0	chair (4)
264.	BINOCULARS	4	2	binocul* (1) camera (1) gates† (1) telescope (1) torah† (1)
265.	BIRDHOUSE	2	0	house (5) bird cage (1) bird feeder (1) bird home (1) cuckoo clock† (1)
266.	**BIRD NEST**	0	0	nest (1)
267.	BLIMP	5	2	air balloon (1) bomb† (1) pickle† (1) submarine† (1)
268.	CAMERA	0	0	
269.	**CHEST**	3	1	box (11) suitcase (4) trunk (2) carriage† (1) caset† (1) toy box (1) toy chest (1) treasure* (1) treasure box (1) treasure chest (1)
270.	CHIMNEY	0	0	roof (7) smoke (4) chimney with smoke (1) house (1)
271.	CLOSET	0	0	clothing (1) coat closet (1) door (1)
272.	**COLANDER**	10	4	bowl (6) strainer (4) pot (3) bathtub† (1) pan (1)
273.	CUTTING BOARD	18	0	cardboard† (1) chopping board (1) to clean floor† (1) dustpan† (1) mirror† (1) paint brush† (1) pancake flipper† (1) plattered† (1) sandwiches† (1) shovel† (1)
274.	DOLPHIN	0	1	whale (8) seal (1) shark (1)
275.	DUSTPAN	4	15	shovel (3) broom pan* (1) clean up* (1) sweeping thing* (1)
276.	FAN	5	2	fanning* (1)
277.	**FAUCET**	1	1	sink (18) water (4) bathtub (2) bath* (1) water thing* (1)
278.	FEATHER	0	0	leaf† (4)
279.	**FERN**	6	0	plant (13) tree (3) rock (2) branch (1) flower (1) island (1) plant and rock (1) table† (1) wheat (1)
280.	FERRIS WHEEL	6	5	merry-go-round (4) ride (1) roller coaster (1) windmill† (1)

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	Intended Name	DKO	DKN	Nondominant Names
281.	FIRE HYDRANT	3	17	holes† (1)
282.	**FISHHOOK**	11	1	hook (13) anchor (2) fishing hook (1) fishing rod (1) nail† (1)
283.	**FISHING REEL**	22	1	baby chair† (1) sharpener† (1) spinning wheel† (1) stool† (1) table† (1) table that fail† (1) tape† (1)
284.	FLASHLIGHT	2	0	shower† (1) water from shower† (1)
285.	GLOBE	2	1	world (5) globe of the world (1) map (1) scaloscope† (1)
286.	**GOGGLES**	3	2	binoculars (16)
287.	**GRILL**	5	5	barbecue (8) stove (2) fire* (1) frankfurters (1) french fries (1) hot dogs (1) oven (1) stove pot* (1)
288.	**GROCERIES**	2	0	bag (5) bag (full) of food (4) shopping bag (4) box† (2) food (2) garbage bag† (2) bag full of groceries (1) bag with trash† (1) garbage† (1) garbage can† (1) grocery bag (1) trash† (1) vegetables (1)
289.	HEADPHONES	11	7	earphones (3) microphones (1) monster† (1) radio thing* (1) telephone wire† (1)
290.	HIPPOPOTAMUS	4	1	hippo (4) buffalo (1) rhino (1) rhinoceros (1)
291.	**HOE**	6	4	rake (8) shovel (6) raker* (1) to dig inside* (1)
292.	**LANTERN**	9	0	lamp (7) light (7) light bulb (1) oil lamp (1) night light (1) to mix stuff† (1)
293.	LAWN MOWER	9	5	tractor (2) beaver† (1) bicycle† (1) mower (1) toy† (1)
294.	**LOGS**	1	0	wood (12) bricks (2) chop(ed) down tree (2) tree (2) fire place (1) furniture† (1) piece of log (1)
295.	**MARACAS**	7	12	rattles (4) cymbals (1) fent† (1) ishtubits† (1) mittens† (1) shakers* (1)
296.	**MICROSCOPE**	12	2	telescope (9) machine (1) magnifying glass (1)
297.	NET	2	2	basket (1)
298.	**PADDLE**	4	4	mirror† (7) tennis racket (5) spoon† (2) bat (1) fan† (1) gigantic spoon† (1) little spoon† (1) maracas† (1) pan† (1) ping pong thing* (1) tennis* (1)
299.	PARACHUTE	5	1	balloon (2) air balloon (1) hot air balloon (1)
300.	PARROT	1	0	bird (11) eagle (1) owl (1) parrot kid (1)
301.	PICTURE	0	0	painting (2)
302.	**PINBALL MACHINE**	13	1	bed† (6) game (4) electric ping pong† (1) table† (1) tool case† (1)
303.	**PLATYPUS**	19	0	duck† (4) bird† (2) duckbill platypus (1) mermaid duck† (1)
304.	RAKE	3	3	raker* (2)
305.	**ROCKET**	2	1	rocket ship (17) space ship (3) rocket taking off (1) space shuttle (1)
306.	ROPE	0	0	string (1)

	Intended Name	DKO	DKN	Nondominant Names
307.	SADDLE	13	10	
308.	**SAFE**	4	2	refrigerator† (9) bank (2) lock (2) ice box† (1) locker (1) safety* (1) small fridge† (1) toaster† (1)
309	SCALE	11	2	measuring thing* (2) measure mail* (1) pounder* (1) swing† (1) tester† (1) weight* (1) wire† (1)
310.	**SCOOP**	4	0	shovel (9) spoon (9) bat† (2) dust pan (1) little spoon (1) mirror† (1) scooper (1) sugar spoon (1)
311.	**SHOWERHEAD**	0	2	shower (22) water (2) water from a shower (2) bath (1) shower thing* (1)
312.	**SYRINGE**	2	2	shot (20) needle (2) shot thing* (2) needle for shot (1)
313.	TAMBOURINE	1	10	bug trap† (1) drum (1) instrument (1) measure† (1)
314.	TELESCOPE	9	4	microscope (2) bomb† (1) gun† (1) looking thing* (1)
315.	THERMOS	16	1	cup (3) juice box (1) salt† (1) salt and pepper† (1) tea maker† (1) water case† (1)
316.	**TIRE**	2	0	wheel (18)
317.	TRACTOR	8	1	truck (6) car (2) bike (1) grass mower (1) lawn mower car (1) motorbike (1)
318.	**TRAM CAR**	3	11	cable car (4) helicopter (4) airplane (1) cable cart* (1) chair lift (1) crane† (1) elevator (1) ride (1) roller coaster (1) sky ride (1)
319.	**WEATHER VANE**	18	7	arrow (2) rooster† (1) sign where to go† (1)
320.	YOYO	0	0	yoyo ball (1)
321.	ZIPPER	8	0	
322.	ANTEATER	20	2	bird† (1) elephant (1) fox (1) kind of animal (1) woodie wood pecker† (1)
323.	**ANVIL**	26	0	bread cutter† (1) iron table† (1) something that kill† (1) table† (1)
324.	**ARCH**	4	1	tunnel (13) bridge(4) door (2) wall (2) bricks (1) entrance (1) gate (1) track† (1)
325.	**ARMADILLO**	19	1	rat (5) mouse (3)
326.	**AVOCADO**	10	3	egg† (5) melon (2) watermelon (2) cantaloupes (1) kind of boat† (1) peach (1) piece of bread† (1) pit (1)
327.	BASEBALL GLOVE	1	2	glove (7) baseball mitt (3) mitt (3) mitten† (2) baseball mitten* (1)
328.	BAT	1	0	bird† (1)
329.	**BIRDCAGE**	4	0	cage (15) animal cage (1) bird nest (1) house (1) parrot cage (1)
330.	**BLOWFISH**	15	2	fish (6) fat fish (2) face† (1) head† (1) puff fish* (1) puffer fish (1)
331.	BRAIN	1	1	face (2) bones† (1) head (1) human brain (1) inside the head* (1) inside of you† (1) person (1)
332.	**BUFFALO**	16	1	bull (4) yak (2) animal (1) horse (1) ox (1) sheep (1) wolf (1)

	Intended Name	DKO	DKN	Nondominant Names
333.	CACTUS	5	2	tree (2) candies† (1) desert (1) pine tree (1)
334.	**CALIPERS**	17	0	belt† (5) necklace† (5) holder† (1) rope† (1) tweezer† (1)
335.	CAN	2	0	garbage can (3) can of paint (1) trash can (1)
336.	CHEESE	0	0	piece of cheese (1)
337.	**COCKROACH**	5	0	bug (13) spider (4) ant (1) crab† (1) cricket (1) ladybug (1)
338.	**COMPASS**	2	0	clock† (22) watch† (4) pocket watch† (1) timer† (1)
339.	CRAB	5	1	lobster (4)
340.	**CYMBALS**	8	5	wheel† (4) weights† (3) yoyo† (2) door knob† (1) something that you lift up† (1) spool of thread† (1) string thing† (1) weight lift† (1) weight thing† (1)
341.	**DART**	15	2	needle† (3) arrow (2) shot† (2) asparagus† (1) bow and arrow (1) carrot† (1) pen† (1)
342.	DINOSAUR	2	0	
343.	DOGHOUSE	0	0	house (1) house for a dog (1) little house (1)
344.	**DRAGONFLY**	2	0	butterfly (13) bee (1) beetle (1) bird† (1) dragon bee* (1) fly (5) mosquito (2)
345.	EASEL	1	5	painting thing* (2) chalk board (1) paint stand* (1) painter thing* (1) painting (1) painting board (1) paints* (1) picture (1) pin board (1)
346.	**EEL**	11	1	fish (6) snake† (3) electric eel (2) lizard† (2) baby snake (1) worm (1)
347.	**FISHBOWL**	1	2	fish tank (13) bowl (3) fish bottle* (1) glass† (1) plant (1) tank for fish (1)
348.	**FISHTAIL**	2	1	fin (8) tail of a fish (5) fish's tail (4) tail (4) back of a fish† (1) fin of a fish (1)
349.	FLAMINGO	5	4	swan (3) ostrich (2) bird (1) goose (1) ostiment† (1) peacock (1)
350.	FUNNEL	12	12	colon† (1) cup (1) sand cup (1) talking in loud voice† (1)
351.	HAMBURGER	2	1	sandwich (10) burger (1) cheeseburger (1) hamburger sandwich (1) pie (1) roll with hamburger (1)
352.	HAMMOCK	11	4	bed (6) boat† (1) outdoor bed (1)
353.	HARMONICA	5	11	instrument (2) baranama† (1) flute (1) make music* (1) whistle (1)
354.	HORSESHOE	7	0	magnet† (9) rope† (1)
355.	**HYENA**	10	1	wolf (8) fox (4) dog (2) animal (1) cat (1) deer (1) leopard (1)
356.	IGLOO	10	2	house (2) cave (1) tepee (1)
357.	JAR	1	1	can (4) bottle (2) glass (1) pickle jar (1)
358.	JELLYFISH	14	2	kind of fish (1) noodles† (1) octopus (1) part of a body† (1) rock† (1)
359.	KOALA	4	1	koala bear (7) polar bear (4) bears (3) panda bears (2) cub and koala bears (1) two little bears (1)

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	Intended Name	DKO	DKN	Nondominant Names
360.	**LADLE**	1	1	spoon (20) soup spoon (2) spoon for soup (1) spoon to pick up (1)
361.	LADYBUG	2	2	bug (2) spider (1)
362.	LAMB	2	1	sheep (10) goat (2) calf (1) cow (1)
363.	LIPSTICK	1	0	
364.	LIZARD	3	0	alligator (1)
365.	**LLAMA**	18	0	camel (7) animal (1) deer (1) horse (1)
366.	LUNGS	5	0	inside of you (your body, inside someone's body)† (4) person† (2) back of body (1) body and head (1) head (1) heart (1) man† (1) ribs (1) somebody's lungs (1) stomach (1)
367.	MOOSE	13	1	goat (2) cow (1) deer (1) horse (1) ram (1)
368.	OCTOPUS	3	1	
369.	PALM TREE	3	0	tree (12) pinkon tree (1) tree (coconut) (1)
370.	**PANDA**	2	0	panda bear (10) polar bear (6) bear (5) koala bear (1)
371.	PEAS	7	2	string bean (4) beans (2) pea pod (2) banana† (1) chicken† (1) corn (1) green peas (1) gum on teeth† (1) leaf† (1) snail† (1) sweet peas (1)
372.	**PELICAN**	13	5	bird (5) flamingo (1) ostrich (1) parrot (2)
373.	PRETZEL	0	0	bagel pretzel (1)
374.	PROPELLER	15	3	fan† (2) frisbee† (2) dragon bee† (1) peller* (1) spinning wheel† (1) tie† (1) wheel that spins† (1)
375.	PYRAMID	5	2	tent† (4) temple† (3) mountain† (2) triangle† (2) mountain from Egypt* (1) tepee† (1)
376.	RAT	1	1	mouse (10)
377.	**RAY**	10	3	bat† (7) bird† (3) sting ray (2) flower† (1) flying fox† (1) kite† (1)
378.	**ROSEBUD**	1	0	flower (15) rose (11) bud (1) flower growing (1) tulip (1)
379.	SAXOPHONE	2	8	trumpet (5) horn (1) music* (1) music thing* (1) sax (1)
380.	**SCORPION**	3	0	lobster† (11) crab† (10) ant (1) cockroach (1) hermit crab† (1) spider (1)
381.	SHARK	0	0	fish (3) whale (3)
382.	SKELETON	1	0	bones (4)
383.	**SKULL**	1	0	skeleton (9) skeleton face (5) face (2) head (2) head bone (2) skeleton head (2) bones (1) ghost† (1)
384.	**SPATULA**	6	9	pan (4) shovel† (4) mirror† (2) frying (something)* (1) rake† (1) utensil (1)
385.	SPIDER WEB	0	0	web (4)

	Intended Name	DKO	DKN	Nondominant Names
386.	SQUASH	23	2	balloon† (1) behind† (1) seed† (1)
387.	STARFISH	1	0	star† (5) sea fish (1) star siso† (1)
388.	STETHOSCOPE	4	16	doctor's thing* (2) telescope (2)
389.	SWORDFISH	3	2	fish (5) shark (3) fish killer* (1) knife fish* (1) sea fish (1) shark fish* (1) sword shark* (1)
390.	THERMOMETER	4	1	temperature* (9) measure† (1) pressure† (1) take a temperature* (1) tell you the weather† (1)
391.	TOTEM POLE	17	3	statue (2) Indian thing* (1) pole (1) sculpture (1) statue of faces (1) tep pole† (1) tomahawk† (1)
392.	**TOUCAN**	3	1	bird (12) parrot (11) parakeet (1)
393.	TURKEY	1	1	chicken (4) rooster (2) peacock (1)
394.	**VULTURE**	7	2	bird (9) eagle (7) peacock (2)
395.	WALRUS	9	3	seal (7) sea lion (2) dolphin (1) ostrich† (1)
396.	WASHING MACHINE	3	2	washer (3) dryer (2) drying machine (2) dish washer (1) laundry* (1) laundry machine (1) washing* (1)
397.	WHALE	3	0	dolphin (4) shark (4) seal (1)
398.	WHIP	9	1	fishing rod† (6) rope† (5) fish pole† (1) smacker* (1) string† (1)
399.	WOLF	7	1	fox (4) coyote (3) dog (1) owl† (1)
400.	WORM	9	0	snail (3) snake (2) rattle snake (1)

Note: Alternate responses include "don't know object" (DKO), "don't know name" (DKN), as well as all names other than the intended name. Each item in the "Other Names" column is followed by its number of occurrences. Those items whose modal name differed from the intended name are denoted with bold type, and the corresponding modal name (which appears first among the "Other Names") is underlined. Failures to name are distinguished from other types of alternative responses by one of two superscripts. A '†' signifies conceptual failure, i.e., the subject did not recognize the object or its category (e.g. response of stethoscope for a picture of an ashtray). The '*' signifies a semantic failure, i.e., the subject recognized the object but failed to give an appropriate name. Inappropriate names include non-nouns (e.g. "to fix stuff"),

invented nouns (e.g. "switch light," "key locker"), abstract nouns (e.g. "music"), and associated nouns (e.g. "tea" for the picture of a tea kettle).

Table 2: *Nondominant Names Given by Adults to Picture Set-3*

	Intended Name	DKO	DKN	Nondominant Names
322.	ANTEATER	2	0	aardvark (8)
323.	ANVIL	4	7	weight† (1)
324.	ARCH	2	1	archway (3) stone archway (3) doorway (2) arch of doorway (1) entrance (1) stoa (1) tunnel (1) tunnel entrance (1)
325.	ARMADILLO	3	2	aardvark (2) enchilada† (1) opossum (1) rat (1)
326.	AVOCADO	0	2	avocado half (4) apricot (1) egg† (1) eggplant (1) opened avocado (1) peach (1) peach half (1) pit (1)
327.	BASEBALL GLOVE	0	0	mitt (7) baseball mitt (3) catcher's mitt (2) baseball* (1) glove (1) left hand baseball glove (1)
328.	BAT	0	0	
329.	BIRDCAGE	0	0	cage (6) empty bird cage (1) furnace† (1)
330.	BLOWFISH	6	1	puffer fish (5) fish (4) balloon fish* (1) weird fish (1)
331.	BRAIN	0	0	human brain (3) brain and brain stem (1) brain diagram (1) brain and upper spinal chord (1) human brain and stem
332.	BUFFALO	2	1	bison (7) bull (1) ram (1)
333.	CACTUS	0	1	Suguaro cactus (1)
334.	CALIPERS	10	8	clamp† (2) tongs† (2) bent tweezers† (1)
335.	CAN	0	0	open can (6) tin can (3) can of food (2)
336.	CHEESE	0	0	Swiss cheese (13) wedge of cheese (1)
337.	COCKROACH	0	2	roach (7) beetle (5) bug (2) cricket (1) grasshopper (1) insect (1)
338.	COMPASS	0	1	stopwatch† (3) watch† (1)
339.	CRAB	0	0	lobster (1) sand crab (1) scorpion (1)
340.	CYMBALS	5	0	barbell† (4) weights† (3) castanets (1) door knob† (1) dumbbell† (1) records† (1) round blades† (1) spool of thread† (1)
341.	DART	0	0	
342.	DINOSAUR	0	0	tyrannosaurus rex (4) tyrannosaurs* (1) rex* (1)
343.	DOGHOUSE	0	0	dog kennel (1) house (1)
344.	DRAGONFLY	0	3	mosquito (4) butterfly (3) firefly (3) bug (1) hornet (1) moth (1)
345.	EASEL	0	4	blackboard easel (1) painting board (1)
346.	EEL	2	2	salamander (1)

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	Intended Name	DKO	DKN	Nondominant Names
347.	FISHBOWL	0	0	fish tank (4) aquarium (2) goldfish bowl (1) empty goldfish tank (1) fishbowl with water (1)
348.	FISHTAIL	0	0	fin (8) fish fin (2) fan tail* (1) tail (1) tail fin (1)
349.	FLAMINGO	0	2	pelican (5) ostrich (2) stork (2)
350.	FUNNEL	0	2	sieve (1) siphon (1)
351.	HAMBURGER	0	0	burger (4) cheeseburger (2) hamburger on bun (1)
352.	HAMMOCK	0	0	
353.	HARMONICA	4	0	garage† (1)
354.	HORSESHOE	0	0	magnet† (2)
355.	HYENA	3	2	coyote (2) dingo (2) wild dog (2) animal (1) cat (1) fox (1) jackal (1) wolf (1)
356.	IGLOO	0	0	
357.	JAR	0	0	mason jar (2) open jar (2) canister (1) glass jar (1) jar with lid (1) mayonnaise jar (1) screw top jar (1)
358.	JELLYFISH	4	5	potato† (1) sea anemone (1)
359.	**KOALA**	0	0	koala bears (16) bears (1) koala bear with kid (1) koala mother with cub (1) koala mother and cub (1) panda (1) two koala bears (1)
360.	LADLE	0	0	spoon (4) scooper (1)
361.	LADYBUG	0	0	beetle (3) lady bird beetle* (1)
362.	LAMB	1	0	sheep (5) goat (1) lamb kid (1)
363.	LIPSTICK	0	0	
364.	LIZARD	0	0	salamander (7) chameleon (1) iguana (1)
365.	LLAMA	1	3	alpaca llama (1) animal (1) yak (1)
366.	LUNGS	0	1	human lungs (1) lungs and air tube (1) lungs and bronchia (1) mid-respiratory* (1) trachea and lungs (1)
367.	MOOSE	1	6	elk (2) marabou (1) old moose (1)
368.	OCTOPUS	0	0	ink fish* (1) squid (1)
369.	PALM TREE	0	0	palm (1) coconut tree (1)
370.	PANDA	0	0	panda bear (12) polar bear (3) bear (1)
371.	**PEAS**	1	1	pea pod (19) peas in a pod (4) pod (1) snow pea (1)
372.	PELICAN	0	2	bird (2) stork (1)
373.	PRETZEL	0	0	bagel (1)

	Intended Name	DKO	DKN	Nondominant Names
374.	PROPELLER	1	2	pinwheel† (2) ceiling fan† (1) plane propeller (1)
375.	PYRAMID	0	0	
376.	RAT	0	0	mouse (5)
377.	**RAY**	4	4	manta ray (8) stingray (7) bat† (1) man-o-war (1) manta ray eel* (1) praying mantis† (1) sea urchin (1) squid (1)
378.	**ROSEBUD**	0	0	rose (14) branch (2) flower (2) tulip (1)
379.	SAXOPHONE	0	0	trumpet (2) horn (1) sax (1)
380.	SCORPION	0	3	lobster† (8) crab† (1) crayfish (1)
381.	SHARK	0	0	fish (1) whale (1)
382.	SKELETON	0	0	human skeleton (7)
383.	SKULL	0	1	human skull (4) skeleton (1) skeleton head (1)
384.	SPATULA	0	4	aluminum spatula (1)
385.	SPIDER WEB	0	0	web (9) spider's web (4)
386.	SQUASH	5	3	gourd (7) balloon† (1) discarded enema† (1) papaya† (1) squash gourd (1)
387.	STARFISH	0	0	
388.	STETHOSCOPE	0	6	
389.	SWORDFISH	2	1	shark (2) marlin (1) saw fish* (1)
390.	THERMOMETER	0	0	thermostat (1)
391.	TOTEM POLE	0	1	Eskimo totem (1) idol (1)
392.	TOUCAN	0	2	parrot (7) pelican (3) bird (1) relative of the dude on commercial (1) Toucan Sam (1)
393.	TURKEY	0	0	rooster (1)
394.	VULTURE	0	1	bald eagle (3) eagle (3) bird (1)
395.	WALRUS	1	0	sea lion (1)
396.	WASHING MACHINE	0	0	clothes washer (2) laundry machine (1) open washing machine (1) washer (1)
397.	WHALE	1	0	humpback (2) porpoise (2) sperm whale (2) blue whale (1)
398.	WHIP	3	0	bull whip (1) horse whip (1)
399.	WOLF	0	0	coyote (3) fox (1)
400.	WORM	2	0	earthworm (11) snail (2) larvae (1) horn† (1)

Note: Alternate responses include "don't know object" (DKO), "don't know name" (DKN), as well as all names other than the intended name. Each item in the "Other Names" column is followed by its number of occurrences. Those items whose modal name differed from the intended name are denoted with bold type, and the corresponding modal name (which appears first among the "Other Names") is underlined. Failures to name are distinguished from other types of alternative responses by one of two superscripts. A '†' signifies conceptual failure, i.e., the subject did not recognize the object or its category (e.g. response of stethoscope for a picture of an ashtray). The '*' signifies a semantic failure, i.e., the subject recognized the object but failed to give an appropriate name. Inappropriate names include non-nouns (e.g. "to fix stuff"), invented nouns (e.g. "switch light," "key locker"), abstract nouns (e.g. "music"), and associated nouns (e.g. "tea" for the picture of a tea kettle).

Appendix D

The 13 categories with their exemplars:

4-footed animals:	Alligator, Bear, Camel, Cat, Cow, Deer, Dog, Donkey, Elephant, Fox, Frog, Rabbit, Raccoon, Rhinoceros, Sheep, Skunk, Squirrel, Tiger, Turtle, Zebra.
Basic Level:	Bird, Fish, Flower, Tree.
Birds:	Chicken, Duck, Eagle, Ostrich, Owl, Peacock, Penguin, Rooster, Swan.
Clothing:	Belt, Blouse, Boot, Button, Cap, Coat, Crown, Dress, Glove, Hat, Jacket, Mitten, Necklace, Pants, Pocketbook, Ring, Shirt, Shoe, Skirt, Sock, Sweater, Tie, Vest, Watch.
Fruits:	Apple, Banana, Cherry, Grapes, Lemon, Orange, Peach, Pear, Pineapple, Strawberry, Watermelon.
Furniture:	Ashtray, Bed, Chair, Clock, Couch, Desk, Dresser, Lamp, Record player, Rocking chair, Stool, Table, Television, Vase.
Human Body Parts:	Arm, Ear, Eye, Finger, Foot, Hair, Hand, Leg, Lips, Nose, Thumb, Toe.
Insects:	Ant, Bee, Beetle, Butterfly, Caterpillar, Fly, Grasshopper, Snail, Snake, Spider.
Kitchen Utensils:	Bottle, Bowl, Broom, Cup, Fork, Frying pan, Garbage can, Glass, Kettle, Knife, Pitcher, Pot, Refrigerator, Rolling pin. Salt shaker, Spoon, Stove, Toaster, Wine glass.
Musical Instruments:	Accordion, Bell, Drum, Flute, French horn, Guitar, Harp, Piano, Trumpet, Violin.
Tools:	Axe, Chisel, Hammer, Ladder, Nail, Nut, Pliers, Saw, Screw, Screwdriver, Wrench.
Toys:	Ball, Balloon, Baseball bat, Doll, Kite, Snowman, Swing, Top, Whistle.
Vegetables:	Artichoke, Asparagus, Carrot, Celery, Corn, Lettuce, Mushroom, Onion, Peanut, Pepper, Potato, Pumpkin, Tomato.
Vehicles:	Airplane, Baby carriage, Bicycle, Bus, Car, Helicopter, Motorcycle, Roller skate, Sailboat, Sled, Train, Truck, Wagon.